Assistive Technology Resources for Children and Adults with Disabilities

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contents

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Assistive Technology Individualized Assessment and Education Considerations for Students with Disabilities

"Two things are necessary, the development of individuality and the participation of the individual in a truly social life." Maria Montessori

INTRODUCTION:

Participation in activities is a right for all individuals. The World Health Organization (WHO) defines participation as "an individual's involvement in a life situation, such as leisure, social, and educational activities" (WHO, 2002). According to Key Article 23 of the United Nation's Rights of the Child, "a child with mental or physical disabilities is entitled to enjoy a full and decent life, in conditions that ensure dignity, promote self-reliance and facilitate the child's active participation in the community" (United Nations,1989). In the above quote by Maria Montessori, a renowned physician and educator best known for the Montessori education model, she identifies the critical role that participation plays in a child's development and success for life. Coster et al. (2012) compared the participation level of students with and without disabilities in the school setting by analyzing survey data from 576 caregivers of elementary and secondary students with and without disabilities (282 students with disabilities and 294 students without disabilities) that completed the online version on the Participation and Environment Measure: Children and Youth (PEM-CY) questionnaire. Environmental factors that were supports or barriers to students were also analyzed. Coster et al. found that the mean frequency in participation across five different school activities was lower in students with disabilities compared to their peers without disabilities, with a significant

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BACK TO CONTENTS

difference in the ability to get together with peers outside of class. Caregivers of students with disabilities reported a significant difference in identifying if the environment was a barrier to participation compared to caregivers of students without disabilities. If participation is a key element to student success, then it is critical for the student's education team to consider using assessments that evaluate the student's overall participation in daily activities and identify facilitators to participation.

The WHO Classification of Functioning, Disability, and Health (ICF) is an international framework that guides both medical and educational providers to assess what barriers are impacting a person's ability to participate in daily life activities and what facilitators can be used to promote participation. This international framework guides the evaluation process by considering contextual factors of the environment and personal factors that can impact the person's performance in an activity. The WHO GATE Initiative identifies the primary purpose of assistive technology products is to maintain or improve an individual's ability to participate independently in functional activities; therefore, leading to overall life satisfaction and well-being (WHO, 2018). Assistive technology (AT) was first defined, in the Technology-Related Assistance for Individuals with Disabilities Act of 1988, (P.L. 100-407) as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities." Under the ICF framework model, assistive technology devices (ATD) fall within the environmental context. The ICF defines personal factors that include psychosocial constructs (behavior, motivation, attitude, etc.), a person's goals/dreams, education, and internal needs. In order to determine if a student is successful with their educational plan, we must use an evidence-based assessment process that includes evaluating the student's personal factors and determining their current level of participation, examine barriers that may be inhibiting student participation, and consider the environmental contexts that may facilitate success, which may include the use of an ATD. This paper will examine a comprehensive evaluation process for matching AT to student that includes the use of the PEM-CY, The Matching Assistive Technology to Child-Augmentative Communicational Evaluation Simplified (MATCH-ACES), and the Student Performance Profile (SPP).

THE ASSISTIVE TECHNOLOGY ASSESSMENT PROCESS:

The Individual with Disabilities Education Act (IDEA, 1997) requires that the educational team consider the need for assistive technology for all students with disabilities at the student's annual individual education plan (IEP). This consideration process requires a team approach and should examine the student's performance towards meeting their educational goals. One method of determining the student's current functional ability is to examine their participation in daily school activities. The PEM-CY (Coster et al., 2010) is an assessment tool that evaluates participation in students ages 5-17 across three environments: the school, community, and the home. A younger version for children ages 2-5 is available. The frequency of participation and level of involvement in activities are measured in each environment. The PEM-CY also examines quality of satisfaction of the student's participation and if there is a need to increase participation that can lead to life satisfaction. Barriers or facilitators of participation in the environment are considered, which aligns with the ICF framework (WHO, 2002). The PEM-CY was found to have moderate to good internal consistency within the participation scales and also moderate to good test-retest reliability (Coster et al., 2011). A comprehensive assessment approach could include the student, parents, and teacher(s) completing the PEM-CY before the IEP meeting to help identify areas that are affecting the student's participation as well as environmental barriers that may be impeding the student's participation within the school setting. The information gathered from the PEM-CY guides the IEP team in addressing barriers affecting participation and the need to consider solutions that can promote participation, such as AT. This leads the team to the next step of the assessment process, consideration of AT and the AT evaluation.

Evidence supports the use of AT for students with disabilities. Zapf et al. (2019, 2016, Zapf, 2012) and Watson et al (2010) found significant improvements in students' success towards the mastery of their educations goals when using assistive technology. Van Der Meer and Rispoli (2010) conducted a meta-analysis on students using augmentative and alternative communication (AAC) and voice output communication devices (VOCA). These authors found positive improvements in speech production and communication in 87% of the subjects. Lindstrom and Hemmingsson (2014) completed a systemic review on children using information and communication technology and found positive improvements in school activities and satisfaction of using ATD for schoolwork in children with motor, communication, and visual impairments. Furthermore, Murchland and colleagues (2011) surveyed 98 children with a mean age of 12.6 years and found high satisfaction in the use of ATD to help with homework and school activities. Murchland et al. identified key indicators to success included the selection, reliability, and ease of use of the ATD. While evidence supports the use of ATD for students with disabilities, Wynne et al. (2016) and Henderson et al. (2008) define the importance of considering factors that impact the decision of prescribing an ATD and emphasizes the need for educators and clinicians to use a standard assessment process when evaluating AT for a student/child.

Zapf et al. (2014, 2010) developed the MATCH-ACES assessment to meet the need of an evidence-based AT assessment that was student-centered for use in the educational setting. The MATCH-ACES assessment was created under the Matching Person and Technology (MPT) framework model. The MPT framework (Scherer, 1998) is an effective national and international

BACK TO CONTENTS

Figure 1

evidence-based and client-centered assessment framework process for AT. The MPT and MATCH-ACES align with the ICF Framework and can be used to assess outcome effectiveness of ATD. The MPT and MATCH-ACES model is a continuous process that aims to match the person and AT based on personal and contextual factors that can impact the person's use of AT. The model is designed as a rotating wheel (Figure 1) in keeping with the idea of a continuous and dynamic assessment process. The center of the wheel is the target goal of matching the student to ATD. The first ring of the wheel is the "Person or Student", in which the AT evaluator(s) should consider personal factors that can contribute or influence a person's use of AT. Personal factors can include lifestyle and customary routines, history of AT use, and psychosocial factors such as mood and motivation. The next ring in the model is the "milieu/ environmental" factors that can impact a person's use of AT. This is an area often overlooked but plays a critical role in the use of AT. If the environment does not support the AT, it is likely that the AT will not be used. Factors identified in the environmental/milieu include; the attitudes of others, environmental structure, the culture, economics, and political laws and policies that affect the service and delivery of the AT. The third ring is the technology (ATD) that is being considered for the student. Factors in this construct include; specific device features, usability factors of the device, performance, appearance, availability, and cost, all of which can impact the selection of AT. It is important to consider all three layers of the MPT model and how each ring impacts the decision for the student's match to the ATD. The outer ring of the MPT process is the continuous process of evaluating, selecting the device, accommodating needs and potential changes with service follow-up, and use of AT. This outer layer identified that the process of matching student to technology is a dynamic process and requires follow-up to determine if the outcome of the ATD was effective in supporting the student in participation of the desired activities and achievement of educational goals.

The MATCH-ACES assessment is a streamlined individualized client-centered assessment process. The MATCH-ACES assessment process was found to have good clinical utility (see Figure 2), good internal consistency of "Predisposition to AT Use" scales, and aligns with the IEP process (Zapf et al, 2016). Zapf et al. (2019; Zapf, 2012) found significant improvements ($p < .001$) in student IEP success of 35 students that were assessed using the MATCH-ACES assessment process, and received AT services training on the use of ATD implemented into the student's educational setting. Furthermore, the use of an evidence-based assessment process that utilizes the constructs within the MPT model and incorporates AT service delivery and follow-up on ATD effectiveness can impact the overall abandonment rate of AT as Zapf (2012) reported only 11% of abandonment of ATD after 4-6 months of student use (see Figure 3) compared to the national reported rate of 33% - 78% (Petrie et al. 2018; Scherer, 2005) .

The MATCH-ACES assessment process begins with the identifying the student's desires, goals, level of participation and determining if there are barriers to achieving the student's goals. Within this process, the student's strengths and areas of need are assessed through the use of a Needs Analysis. The "MATCH-ACES Needs Analysis" form can be used to rate the student's participation in school-based both performance and academic skill areas. A comprehensive communication evaluation is also included in the MATCH-ACES assessment for further evaluation of the student's communication needs. The AT evaluator(s) may ask "what areas are impacting the student's performance and could an ATD support the student?" This author will use a case example "John" to demonstrate the MATCH-ACES assessment process for this paper. John (pseudo name) is a student enrolled in 5th grade in public elementary school setting. He is a student diagnosed with Autism and the barrier to his participation in the school setting were the performance skills of socialization and verbal expression/communication. While John has independence with his ADLs, some fine motor dexterity, and mobility, he is having difficulty with communication. John was given a score of "2-Poor" in his ability to communicate, engage, and express himself during group classroom participation. This also affected his behavior and cooperation in activities. John has a desire to communicate and has used some strategies in the past, "Picture Exchange System" and American Sign Language, with some success. However, as he becomes more engaged in the classroom and the need to communicate with peers increases, he is less willing to use pictures and signs. His individualized educational goals related to communication include the ability to greet his teachers and peers, answer questions in class, and express his needs to others. After completing the MATCH-ACES Needs

BACK TO CONTENTS

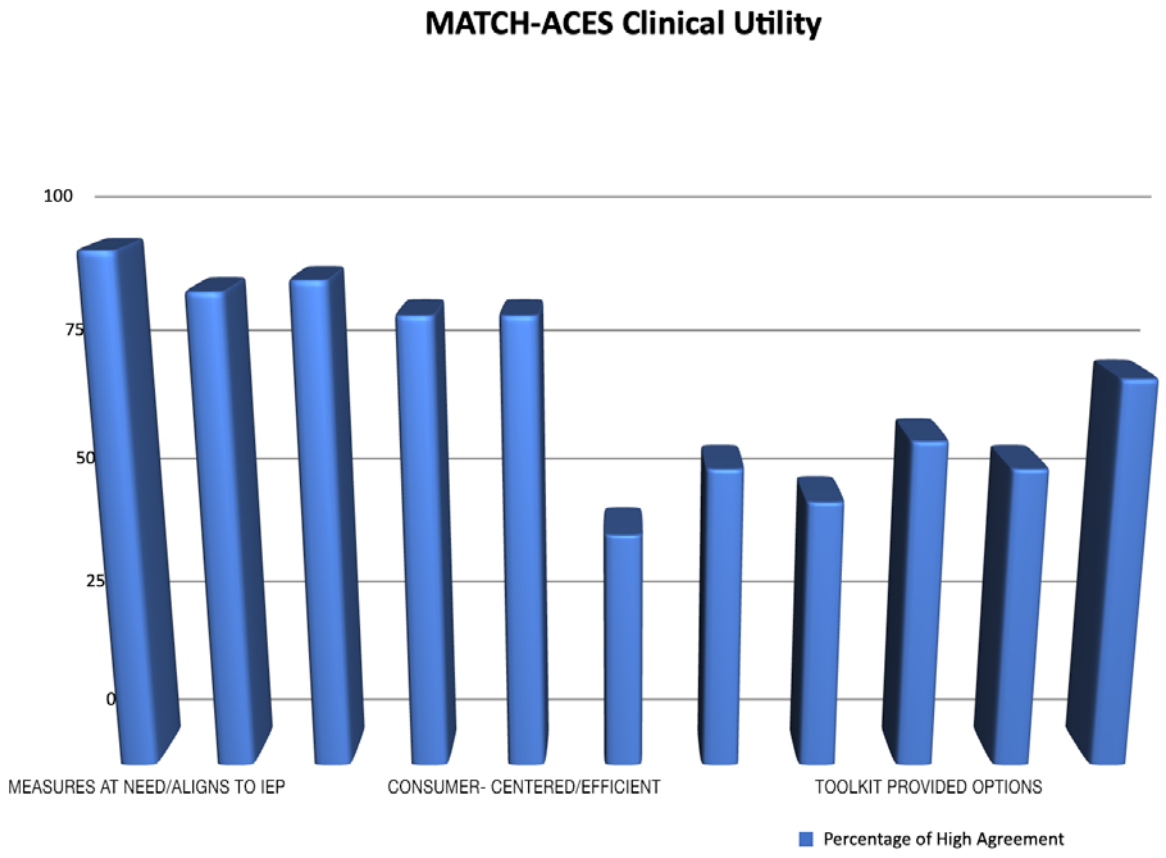

Figure 2: Clinical Utility of MATCH-ACES

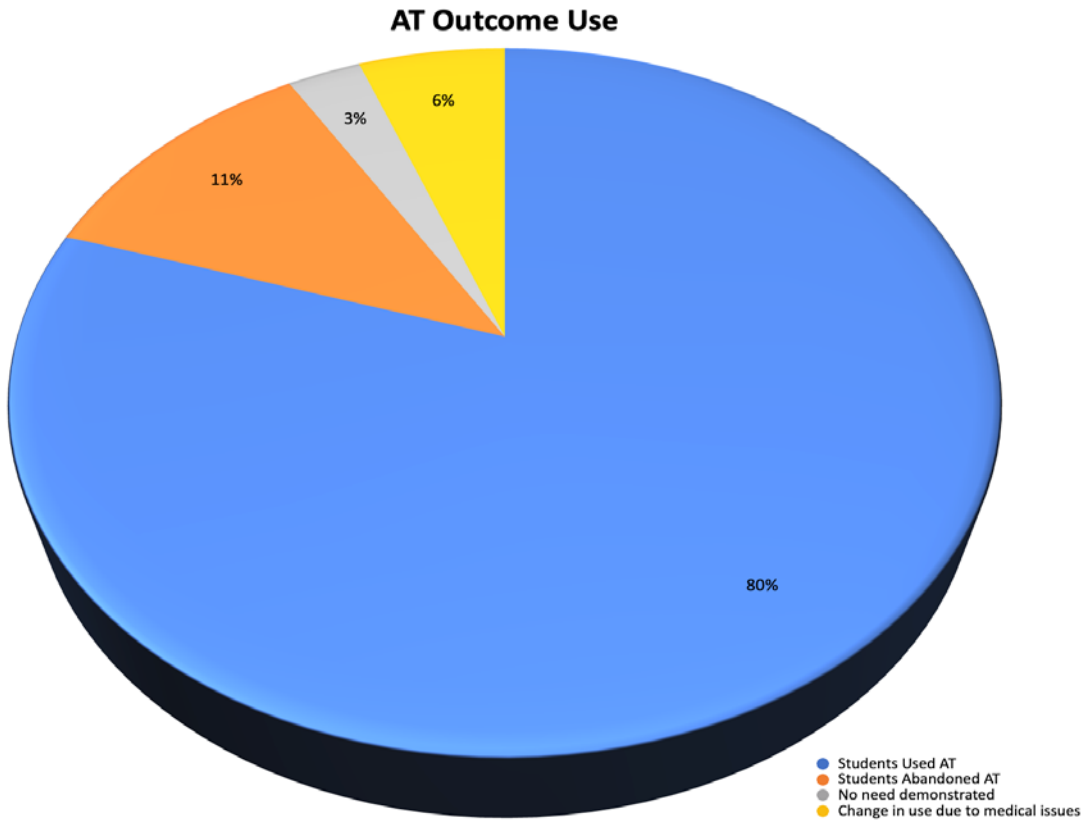

Figure 3: At Outcome Use of MATCH-ACES

BACK TO CONTENTS

Analysis, the findings warranted the need to continue with consideration process of "could a different AT approach help John?" The "MATCH-ACES Person Skills and Device Form" is the next form in the AT process that should be completed. This form is a diagram of a person with performance skill areas that the AT evaluator(s) can use to assess the "person" specifically looking at factors that align with the ICF framework such as functional skills (fine motor, communication, gross motor skills, etc.), and performance skills. It is important to remember that performance skills required for device use overlap with various body structures. For example, the student's fine motor ability and dexterity can impact the decision of the size of keys required for an AAC device, as independent access and ability required to hit a key is an essential consideration in device selection. After the evaluator(s) analyzed the "Needs Analysis", "Person Skills, Device Form" and have determined that the student has a need for AT, the evaluator(s) must consider if AT could help the student achieve the desired goal. This step includes discussion of defining requirement for the ATD, activity, preferences, and demands. John demonstrated fine motor skills of finger isolation and dexterity needed for access. He was able to use four picture sequence to express needs, and he was able to carry a device when mobile in the environment. John's skill and abilities supported further consideration of an ATD.

The next step in the MATCH-ACES process is to determine the "AT Readiness" of the student. This requires the need to evaluate the student's predisposition to AT. The MATCH-ACES "Predisposition to AT Use Form" can be completed by the student, parent, and educators. This form looks at the student's history of AT use, the student's psychosocial or personal factors that can influence AT use (based on the evidence), and the caregiver or teachers comfort and use of AT. The MATCH-ACES "Technology Use Form" should also be completed to give the AT evaluator(s) information on the AT that has been tried or what AT the student is currently using. This form includes information on length of AT use and a rating scale of effectiveness. Both of these forms can provide an analysis of the student's AT readiness and if the student has characteristics that indicate a positive readiness to move forward with the ATD selection phase. Some factors that may indicate a student is not ready include the student does not demonstrate an interest or desire to use the device, or the student had a life events that could impact the effectiveness of learning the device. An example of this could be an inconsistent home life due to family loss of job or home. The instability of knowing where one may live can overload the student's ability and desire to focus on AT use and education because the psychosocial demands of coping with the current situation impact the student's ability to learn a new device. The AT evaluator(s) should analyze the data from these forms and indicate facilitators to support the AT readiness and address any barriers that could impact the student's ability to use AT. In the case scenario, John scored high with AT experience and his facilitators for AT use included motivation to use technology, curious, and willing to learn new technology. He also received a high score on parent comfort and parent willingness to use AT, and had a history of successfully using technology in the home. However, his teacher scored a low interest in willingness and comfort level to use AT within the classroom. This can be a barrier for John's use of AT in the classroom and further investigation of why the teacher was not comfortable should be addressed with the AT evaluator(s). The AT evaluator(s) could provide education and training to help John's education team understand how AT can support his learning and provide positive opportunities for integration within the classroom setting. The AT provider should include service time on the IEP in order to provide training and education to John, his teachers and educational staff.

The next step in the MATCH-ACES assessment process is to compare ATDs that will be the best match for the student in meeting their educational goals. This is an involved process that includes identifying specific characteristics of the device that match the student's needs and skills required to use the device and trial use of the ATDs to determine if this is an effective approach. The MATCH-ACES Forms that are used to help determine the ATD features include the "AAC Device Features to Consider Form" which has a diagram of specific AAC device featrues required on the proposed AAC device. The "AT Device Features to Consider Form", includes specific feature constructs based on the evidence (Scherer et al., 2007) regarding device selection. Environmental factors should also be considered in the AT selection process, especially if there are barriers to access of the AT due to environmental demands (refer to the second ring in the MPT model for consideration of environmental factors). The AT evaluator(s) should complete these forms with the student, parent, and education team. Trial opportunities of the AT should take place in the student's environmental setting that the AT will be used. Data should be collected on trial use that will help determine the effective use of the device when comparing devices. In our case scenario of John, the communication devices that were considered at the time of the evaluation included Picture Exchange System (PECS), iPad with AAC software, or an AAC device from Saltillo with Nova Chat software. While John was successful with the PECS, the evaluator(s) found that it limited his ability and opportunities to engage with his classroom peers and other students and staff in the education setting. His mother noted a lack of use when out in the community due to portability and not having all the pictures needed for John to use when participating in an activity. Initially, John's mother was interested in the use of the iPad with AAC software because John had already owned an iPad; however, over the trial period it was found to not be the best option in regards to durability and dedication for communication. The MATCH-ACES has a "Device Comparison Form" that provides the evaluator(s) with a data analysis comparing the device features and effective use between devices that are being considered (see Figure 4). This form takes the "guess-

DIRECTIONS: write the name of each assistive technology device being considered in the boxes under Device. Then rate each device for characteristics A-M according to the following scale:

Qualifier Scale: **5** = All the time, very positive impact for child and family
4 = Often, a generally positive impact
3 = half the time or mixed impact
2 = Sometimes, but generally negative impact
1 = Not at all, a negative impact on child and family
0 = Not relevant or not assessed

A. Can the device be used with little or no assistance from others?
B. Does the device fit in all desired environments?
C. How much will this device help the child achieve the desired outcomes written above?
D. How much does the child like the device?
E. Does this device require cognitive training or physical adaptation in order to fit with this child's accustomed routine?
F. How accepting is the family about the child using this device?
G. How much will this device improve academic performance?
H. How much will the device improve quality of life?
I. Does the child have the capabilities and stamina to use the device without discomfort, stress and fatigue?
J. Can the device be adapted to accommodate changes in the child?
K. Is training/support and upgrading available for the device?
L. Is the device easy to maintain and have repaired?
M. How easily can this device be integrated into the child's school environment?

Device	A	B	C	D	E	F	G	H	I	J	K	L	M	Total

Figure 4:

work" out of deciding which option is the best because the evaluator(s) can compare critical features of each device based on the student's ability to use the device. Once the device has been chosen a final comparison match checklist can be used to assure that the match between the student and device is in fact a well-thought out and effective match. This moves us to the last step of the MATCH-ACES assessment process, the MATCH Score, implementation, and the development of an AT service plan.

The "MATCH Score Form" is a critical last step in the MATCH-ACES assessment process. This form was developed from the MPT model and evidence on effective device selection and outcomes based on eight criteria (Scherer et al, 2007). The IEP team which includes the student, parent, teacher, and AT Evaluator(s) should look at each criterion and compare the student's abilities/resources to the device features/requirements. A score of five is considered a "good match" while a score of 1 is a "mismatch" based on the skills and requirements examined. In the Zapf et. al study (2019; Zapf, 2012), the use of the MATCH-ACES Assessment process, including the MATCH Score was found to effective in matching 80% of the students to technology that help the students achieve their educational goal. In considering this step in our case scenario, John's AT evaluator(s) completed the MATCH-Score Form when matching the Saltillo Device with Nova Chat to John's skills/resources. John's final MATCH AT score was a 4.5, indicating a close match with the requirements of minor assistance or adaptations related to care and maintenance of the device and training needs for the teacher regarding implementation within the classroom. This information was then used in designing an implementation and AT service plan for John and the use of his AAC/ATD.

When the AT evaluator(s) have found a "good match" between student and technology, then implementation and a service training plan should be considered. If a "good match:" is not found then the AT evaluator(s) need to relook at the AT process and reassess the process. Implementation and follow-up of AT use are critical components of AT success, but is often missed leading to AT abandonment (Petrie et al. 2018; Phillips and Zhao,1993; Riemer-Reiss and Wacker, 1999; and Zapf, 2012). The MATCH-ACES assessment includes a "MATCH-ACES Implementation Plan" that helps the evaluator(s) to consider what training is needed, who is responsible for the training, a training table to document the training, and a timeline with follow-up dates to assure carry-over of the implementation. The MATCH-ACES assessment also includes "MATCH-ACES Follow-Up Scores". The Follow-up scores are written for each AT used. The outcome score is based on a ten-point Likert scale with a recommendation of data to be collected at 3-month, 6-months, and annually. The initial training time period of the first three months is critical as if the student does not see the benefits of AT in the beginning stages of use, there is higher potential of abandonment. Therefore, it is critical to complete this last step of the MATCH-ACES Assessment process. In considering this last step in our case scenario, John's AT evaluator(s) designed an intervention service plan to map out the care and maintenance of the device, including responsibilities of all parties involved. The evaluator(s) also designed a training service plan for the student

BACK TO CONTENTS

in using the device within the classroom and a specific training plan to help John's teacher become familiar and comfortable with the device use in the classroom. Follow-up scores were taken at three months, three months. These scores indicated that John was moderately successful in using the device in the classroom, but some adjustments in the device "pages" were needed to streamline the AAC device communication pages to some of the classroom content, such as the classroom's daily news time. This provided an opportunity for John to be more engaged in the use of his device during class lessons. The follow-up scores and service treatment plan were essential components as time progressed and transition changes happened in John's educational plan and environmental settings.

Another follow-up form that was successful in measuring student success in the Zapf et al. study (2019, Zapf, 2012) is the Student Performance Profile. This form can also be used during the follow-up stage of the AT assessment process. The SPP is an online study measure, for AT Evaluators, developed by the Ohio Department of Education (Fennema, 2004) and The Rehabilitation Research Design and Disability Center (R2D2). This tool is available on the R2D2 center's website in printable version format. The SPP was used in both the Zapf et al (2016) and the Watson et al. (2010) studies and was (2010) studies and was as an effective tool to measure AT effectiveness in relation to IEP success and services provided in the educational setting. The SPP uses interval data and provides a consistent measurement to assess AT performance. The SPP version used includes pre-test and post-test forms. The pre-test forms included three sections: student information, area of need for AT, and IEP goals/objectives. The post-test form included three sections: student information, post-score performance on IEP goals/objectives, and contribution of interventions. The IEP goals/objectives are rated on an interval scale ranging from 0% ability to 100% ability with 10% increments. The contribution of intervention is rated on an ordinal scale with scores ranging from 0 (no contribution) to 10 (substantial contribution), allowing for data to be analyzed statistically when comparing pre-post outcomes.

CONCLUSION:

The goal for the AT evaluator(s) is to provide a thorough AT assessment for students to be successful in their educational setting. This paper discussed the key essential components to a comprehensive AT assessment process. This process requires IEP teams to assess the participation of students with disabilities in the educational setting to assure that they receive the same opportunities to advance and reach their goals and dreams. An AT evaluation should include a process that allows for analysis of facilitators and barriers to participation and then examining AT constructs that include personal factors, AT readiness, AT device features, and selection of the ATD that can support the student in successful participation in activities within the school setting. An AT service plan that includes AT training and follow-up scores should be included within this process. In reconsidering the quote by Maria Montessori, two requirements for a child's success is the development of the individual, and opportunities for participation; what a privilege for the AT Evaluator and the education team to play a role in this process by providing essential pieces to the AT puzzle so that student with disabilities can reach their full potential in life.

For more information of the MPT and MATCH-ACES model please contact Dr. Susan A. Zapf at suezapf@me.com. There is exciting news on Dr. Zapf's upcoming book on the MPT and MATCH-ACES Assessment Model, the title is "***MPT and MATCH-ACES Assessments: An Evidence-Based Framework for Assistive Technology Evaluations***" to be published by CRC Press this coming Fall 2021 in their Rehabilitation Science in Practice Series: https://www.routledge.com/Rehabilitation-Science-in-Practice-Series/book-series/crcpreserin

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BACK TO CONTENTS

AAC Abandonment: Contributing Factors and Possible Solutions

SUE REDEPENNING is the owner of LiveLife Therapy Solutions, Inc. Her company received an Assistive Technology grant from the state of MN in March of 2013 the program is called Technology for HOME. Sue leads 14 Assistive Technology consultants for the Technology for HOME program with degrees in Occupational Therapy, Speech Therapy, Physical Therapy, Nursing or Engineering, and office consultants. The AT consultants travel throughout MN to see people to meet their Assistive Technology needs so they can stay living in their own home or move to live in their own home. The program serves Minnesotans of all ages who have a disability and have MA along with home care services or waivered services. Sue is an Occupational Therapist by background and has worked in the field of AT for over 20 years. She received her Assistive Technology Professional certification from the Rehabilitation Engineering AT Society of North America in 2013. Sue is an elected member of the RESNA board of directors and received the Emerging Leaders award at the end of June 2018 at the RESNA conference. Sue has presented both locally and nationally on the topic of Assistive Technology.

LANE RIALS, is a Speech-Language Pathologist who holds her American Speech-Language-Hearing Association (ASHA) Certificate of Clinical Competence and is Licensed in the State of Georgia. She received her Master of Science in Speech-Language Pathology from Western Kentucky University and Bachelor of Science in Speech-Language Pathology from the University of West Georgia. Her experience includes working with individuals of all ages in many settings including schools, private practice, skilled nursing facilities, and home health.

JILL ADLIN, is a licensed Speech Language Pathologist who has served in a variety of settings including home health, schools, nursing homes and private clinics. Her passion for AAC started 14 years ago when she served children with complex needs at the Ft. Sanders Education Development Center in Knoxville, TN. She served as SLP/AAC specialist on AT teams in Tennessee and North Carolina before coming to Control Bionics. She has particular interest in the issue of AAC Abandonment. She is focused on working collaboratively with individuals who use AAC and their teams to ensure appropriate support of their communication device - so that no device is left sitting on a shelf! If she is not with her clients, she is happiest when she is with her dog and family on an adventure that involves new places, food and music.

BACK TO CONTENTS

INTRODUCTION

The abandonment of Augmentative/Alternative Communications (AAC) systems occurs when an AAC device was recommended, chosen and acquired, but is no longer used by an individual. It's important to differentiate AAC abandonment from AAC rejection, when a person refuses to acquire a device. The question is, *why are AAC devices abandoned, when the person and their team – speech and language pathologists, occupational therapists, other therapists, schools, doctors, family and caregivers – have together invested a great deal of time and energy into device evaluation and selection.*

A team of AAC professionals had the opportunity to gather for a panel discussion at the 2020 Closing the Gap Virtual Conference in October. The panel reviewed the reasons that individuals give up on their AAC devices, as well as ways in which we might mitigate abandonment. The panel included Vicki Clarke, CCC-SLP, CEO of Dynamic Therapy Associates, Inc. (DTA), a speech language pathology clinic specializing in AAC; Shari Willingham, SLP-A, AAC expert, parent of an AAC user, and DTA office manager; Carol Page, PhD, CCC-SLP, ATP, CBIS, program manager of the South Carolina Assistive Technology Program (SCATP) at the USC School of Medicine; Sue Redepenning, OTR/L, ATP, owner of LiveLife Therapy Solutions, Inc. and program director for Technology for HOME in Minnesota; and Lane Rials, CCC-SLP, a regional consultant with the Control Bionics and a speech-language pathologist who previously served individuals of all ages in schools, private clinics, skilled nursing facilities, and in their homes; Jill Adlin, CCC-SLP, also a regional consultant with Control Bionics and a speech pathologist who served a wide range of ages and disorders in private clinics, home health and in school systems in TN and NC where she served as an AAC specialist on Assistive Technology teams.

While the factors contributing to abandonment continue to present problems for AAC users and their teams, the panel's discussion provides hope that AAC abandonment can be reduced with the right combination of communication, honesty, commitment, goal-setting, consistency, and support.

Why are AAC Systems Abandoned? Throughout the research on abandonment, ten factors contributing to ACC system abandonment consistently emerge:

- Device/system is not a good fit for the user
- Need for system is not recognized
- System is unable to change as user's communication/physical needs change
- System is not reliable
- Inadequate tech or customer support is available for device/system
- Family was not included in decision-making process
- Adequate follow-up support was not provided
- Professionals have negative attitudes
- User and family have no community of support

Our panelists were candid about how they've seen these factors play out. Sue Redepenning looked back to the very beginning of her program in Minnesota, saying, "There's a time, knowledge and learning commitment to AAC, and we weren't sufficiently educating families about that. It's something we've worked very hard to improve over the past few years."

As the parent of a 25-year-old autistic man, Shari Willingham admitted that there's a disconnect between assumptions and reality. "Many families believe that you can just bring in this magic piece of equipment and boom, everything is fine. Plus, a lot of parents believe that they 'speak' their own child's language, so they don't necessarily see a need for a device."

Vicki Clarke echoed those sentiments, saying, "We're not slowing down enough, to enable everyone's buy-in. Users and parents need to know what to expect when that device shows up. It's not a Band-Aid and it's not going to immediately solve all the user's communications problems. Potential users and their families aren't fully warned that there will be frustrations."

The panel stresses that it's critical that everyone involved understands that AAC device abandonment is not a failing – of the user, the family, the therapist, the program, or even the company providing the device. When abandonment occurs, it's important to critically analyze what happened. What were you trying to achieve? What happened to make that feel unattainable? Are there specific factors that caused the user or family to give up on the AAC system? Universal Design for Learning, a brilliant concept that has provided successes for people of all abilities can also present the danger of driving usage of a device that doesn't fit (for whatever reason), ultimately leading the team to believe that AAC "doesn't work" and shouldn't be further pursued for that individual.

ROOM FOR IMPROVEMENT EVERY STEP OF THE WAY

The good news is that understanding the reasons behind AAC abandonment can lead us to some possible solutions. The panel identified five categories where possible solutions to avert abandonment are being developed:

- Partner knowledge
- Pre-training - setting of expectations and goals
- Supports for users and families
- Payment sources
- Tech support – creating a back-up plan

Obtaining and using an AAC device is a process, not a one-and-done event. Successful implementation requires ongoing effort from all parties involved. Pre-training and support for users and families are especially important and an area where lots of solutions are emerging.

EDUCATE THE ENTIRE TEAM RIGHT FROM THE START

Making sure each member of a child or adult's team has the tools and knowledge necessary for their AAC journey is crucial.

BACK TO CONTENTS

Family input and involvement at every stage is crucial for successful AAC adoption.

Everyone must understand what AAC is, why it is being recommended, how it will be supported and implemented. Beyond evaluating and choosing an AAC system, team members must receive ongoing education and follow-through to help avoid pitfalls, frustration and possible abandonment.

As professionals, we understand the huge commitment that AAC requires. But how much do we know about the individual and their family, the other commitments and challenges they face, and how using a communication system would fit into their world? The panelists agreed that honoring the AAC user and their families' values and really understanding the day to day demands of their lives is crucial. Professionals need to be mindful about this and aware of cultural considerations as they train the user and their communication partners.

Sue Redepenning and her team at Technology for Home have created a video and PowerPoints that are used to explain AAC systems - from low tech to high tech. These are shared with families and/or AAC users at the very beginning of their AAC process. Families get to see the entire process ahead of time - how the technology will be taught and evaluated, and what will be asked of the user and family/caregiver. That's just the first step. "Next, we screen to find out what the person has previously tried, what she or he can and cannot communicate, what's most important to the individual and the family, and any cultural considerations. We use that information to choose the right team to help that person evaluate AAC. By sharing the knowledge each of us has up front, we enable the user and family to know what they're being asked to do…and perhaps it's not the right time for them to do it."

Of course, an individual using an AAC device is not with his or her family all of the time. Dr. Carol Page talked about the other partners AAC users have in their community and the significance of their inclusion in the knowledge base. "It's important to be sure that the speech-language pathologist, the OT and PT are on board, as well as the behavior analysts, who come at implementation from a different angle. To get everyone on the same page is so crucial."

Sue shared how her experience prior to the Technology for HOME program has influenced her current approach. "During all my years in the clinic, we often didn't realize what we didn't know. We totally underestimated the impact of AAC on families. We each came at it from our personal perspective. But if you start with the entire team together, collaborating from the beginning, and really see the person/families environment/needs you learn from each other's perspectives and eliminate complications in that relationship. The ability for the person and their team to be honest in the process is so important, building that trust so that can happen is critical."

Vicki advocated for establishing rapport among the user's partners. There are many ways to approach this and she shared one that her practice uses: "We've started to do a simple survey of all stakeholders during the evaluation process, using a Google form. We ask what currently isn't working for the individual, what should happen as a result of her or his AAC use, and ideally what would happen for the user with an AAC device in place." Open dialogue among the AAC user's team will ensure everyone is on the same page, understands the goals and next steps and are having their concerns heard and acted upon.

TAKE TIME TO SET GOALS AND EXPECTATIONS

Once there's an established rapport, the team should set objectives that are realistic for the AAC user and the family, and that coincide with other related targets already in place. The goals an individual has today will not be those that he or she will have in six months, a year or five years. We need to base today's goals on tomorrow's. We must also remember that user/family goals and those of other team members like therapists and schools are not mutually exclusive. Every member of the team brings value to the table. But if we fail to meet the immediate needs of a user and their family, we'll never have the opportunity to aim for long-term goals.

When we see someone approaching an AAC program with a goal in mind, eager to be part of the program, it's far easier for that user to manage when difficulties come along – and they will. By offering pre-training, and setting appropriate expectations, we have laid a foundation for tackling issues and finding solutions when a challenge presents itself. When a user is begin-

ning a trial, it helps to ask "What do you expect from AAC? What do you want to happen during the time you have this device?" Keeping these questions in mind allows the individual and family to stay focused on the purpose of the trial and allows the team to serve the individual and family properly.

Vicki reminded the panel that we must be cautious about how we communicate with prospective AAC users and their families. "We have to watch our jargon when we're talking to families about goal setting. We need to look at the individual and her or his environment first, then the tasks that they need to accomplish. We also have to listen to the parents or caretakers, because they are often just looking for the basics. If we can help them, and the AAC user, achieve those things, we'll have better success educating them and expanding goals over time."

SUPPORT USERS AND FAMILIES FROM MULTIPLE DIRECTIONS

The prospect of using an AAC system should not be a source of stress or pressure for individuals and their families. As Shari pointed out, "Many people simply need that child or older family member to communicate other than with behaviors. If you don't begin with helping the user and family get what they need at home, you're not going to get the parent's/caregiver's support."

In today's world, device users and their families have access to lots of resources that would have been difficult to obtain in the past. But when we talk about supporting users and their families, we're not just referring to therapists and all the valuable resources on the internet. It's evident that parents and family members of individuals already using AAC devices can be what Lane Rials called a "bridge" to other families, whether they're deciding if an AAC device is the right choice or struggling with the prospect of abandonment. Connecting with other device users and their teams - in person or through an online source, like an AAC user Facebook page - can be an invaluable support.

Vicki's organization has taken it one step further. "We deliberately hire people for our front office who have experience with communication challenges. One of our first office managers had a daughter with autism. When she had to leave, we hired her mother. I guarantee that families never tell us clinicians some of the things they share with Shari and our other parent employees."

Shari is eager to help other families who are walking in her shoes. "It's nice to be there when parents are in the early stages, or 10 years into a communications device and struggling, or even getting close to abandonment. My colleague Patty and I can tell them that our sons didn't initially like their devices and it was a struggle. My son was probably in his early teens before he began using his device willingly. That's when he realized that it enabled him to control his own world. It's important to be able to remind parents that a communications device isn't an instant fix. There will be steps forward, and maybe a couple back. It's a process, and it doesn't happen as quickly as we parents would like most of the time."

Carol noted that mentors are extremely valuable in showing AAC users what they can achieve. "A role model can show beginners what they're working towards. It's encouraging for children to see adults who are proficient AAC users in college, working at a job and living by themselves. Even people with neurologic disease or TBI can see people who have lived what they're experiencing and that they're successful as a result of working hard and learning this new skill."

Sue pointed to the positive impact of support groups to assist AAC users both physically and emotionally. "In Minnesota, there's an AAC user group that gets together once a month, currently on Zoom. They share their experiences with their devices. It's awesome to watch them troubleshoot together!"

Besides honesty and peer interaction, identifying and celebrating small advances in AAC use were advocated by everyone on the panel. Shari recommended a self-support tool for parents and caregivers. "Start a journal, but not something you have to update or visit every day. Chronicle what you can when you can. Then when you're frustrated, go back and look at where your child or older family member is today, versus where they were three or six months ago. Even baby steps can feel huge."

SEEK CREATIVE WAYS TO MEET FUNDING CHALLENGES

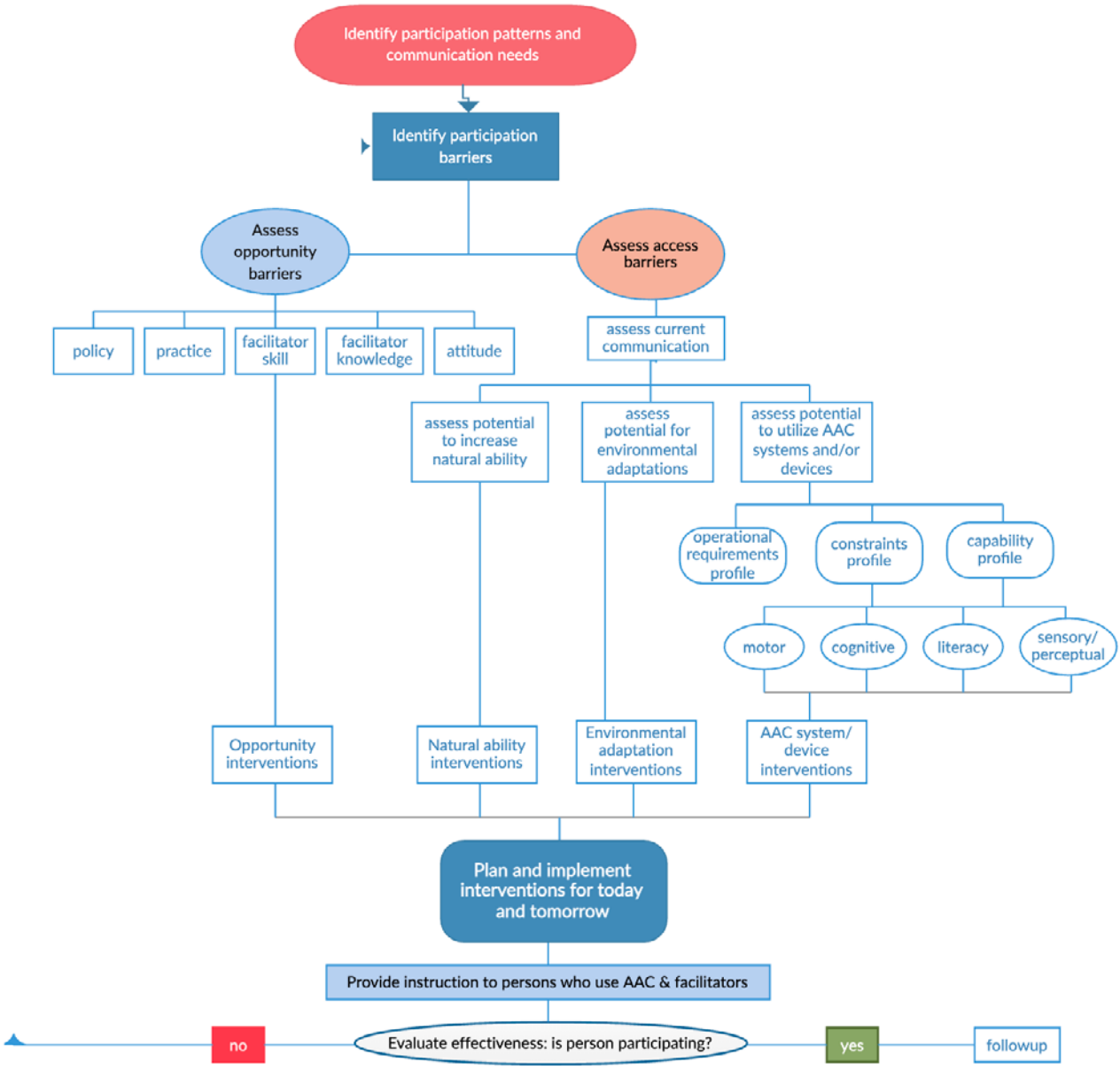
The process of funding AAC systems can be incredibly frustrating, time-consuming, stressful and confusing for users, family members and clinicians. From a historic lack of funding options to wrangling with insurance providers, it often seems like an insurmountable task to both co-treat with professionals from other disciplines, and to pay for the selection and ongoing support of an AAC device.

The American Speech-Language-Hearing Association (ASHA), the AAC Institute, USSAAC, and the Assistive Technology Industry Association (ATIA) are just some of the numerous resources for therapists, schools and families seeking funding, billing and reimbursement information for speech generating and other assistive devices. Unfortunately, reimbursement models often make it more difficult to collaborate on AAC usage, as Vicki explained. "We're funded through Georgia Medicaid, so we're not allowed to provide the same service at the same time as the school-based clinician. If we meet together with the user, one of us does not get paid."

However, grants are a worthwhile funding option for programs, therapists and families to explore. Sue outlined how her program operates. "Our grant allows us to bill the state of Minnesota directly. So we can provide services even if another therapist is also seeing that AAC user, as they're billing Medicare or Medicaid or insurance, we are not. Communicating with all the partners is rarely done, and we have the ability of being able to do it in our program, that is huge. The other model in Minnesota we are exploring is the ability to bill Medicaid through waivers in Home and Community funding to allow more services to be offered in

BACK TO CONTENTS

The Participation Model Framework for the Assessment of AAC
based on Beukelman & Mirenda, 1988



this teaming where there is not a grant to cover these needs"

DON'T CHOOSE THE TOOL AND WORK BACKWARDS

The AAC device itself is the final piece of the communication puzzle. It is the culmination of everything that's been discussed: educating the team, setting expectations and goals, creating a support network for the user and family, securing funding and of course, a thorough evaluation of the user's motor, sensory and language skills. Each piece of the puzzle is influenced by the others. So when it's time to evaluate and select an AAC system, everyone involved realizes how the journey to that point has been circular, not linear.

Sometimes, parents are offered an iPad by the school, or otherwise pushed into an AAC acquisition before the individual and/or family are ready for it. Parents think they're "horrible" if they say no to a device. But that's where establishing an honest and open flow of communication right up front works best. No matter what the role, no one on an AAC user's team should feel that they're letting anyone down during the AAC process, including technology evaluation and selection. When it comes to AAC, there's no single correct answer. The team is trying a new tool, and it may work temporarily, permanently…or not at all. If they don't get it right the first time, they learn and try something else.

BACK TO CONTENTS

During this process, SLPs need to be careful about recommending the device or system they feel most familiar with. It is easy for an unconscious bias toward the familiar to impact decision making and what's familiar is not necessarily what's best for the AAC user. To support users and families properly and professionals must be well-versed in all the available AAC tools which can be quite an undertaking in a world where new options are becoming available so quickly. Vicki summed it up, saying, "We shouldn't be learning about equipment in silos. We should be able to evaluate them side by side, comparing and contrasting features. This would enable us to ask more questions as we're trying things out for each potential user."

Lane agreed, noting that it's easy for those with more experience with AAC systems to form biases towards certain solutions. "Receiving feedback from users and their families is absolutely necessary. I ask them what they'd like to be able to do, and what they want the device or app to do for them. Motivation is huge in successfully selecting an AAC solution." This focus on the user and their needs will guide the team toward the most appropriate device solution. To best help them meeting their needs we want to help them find a device that will be:

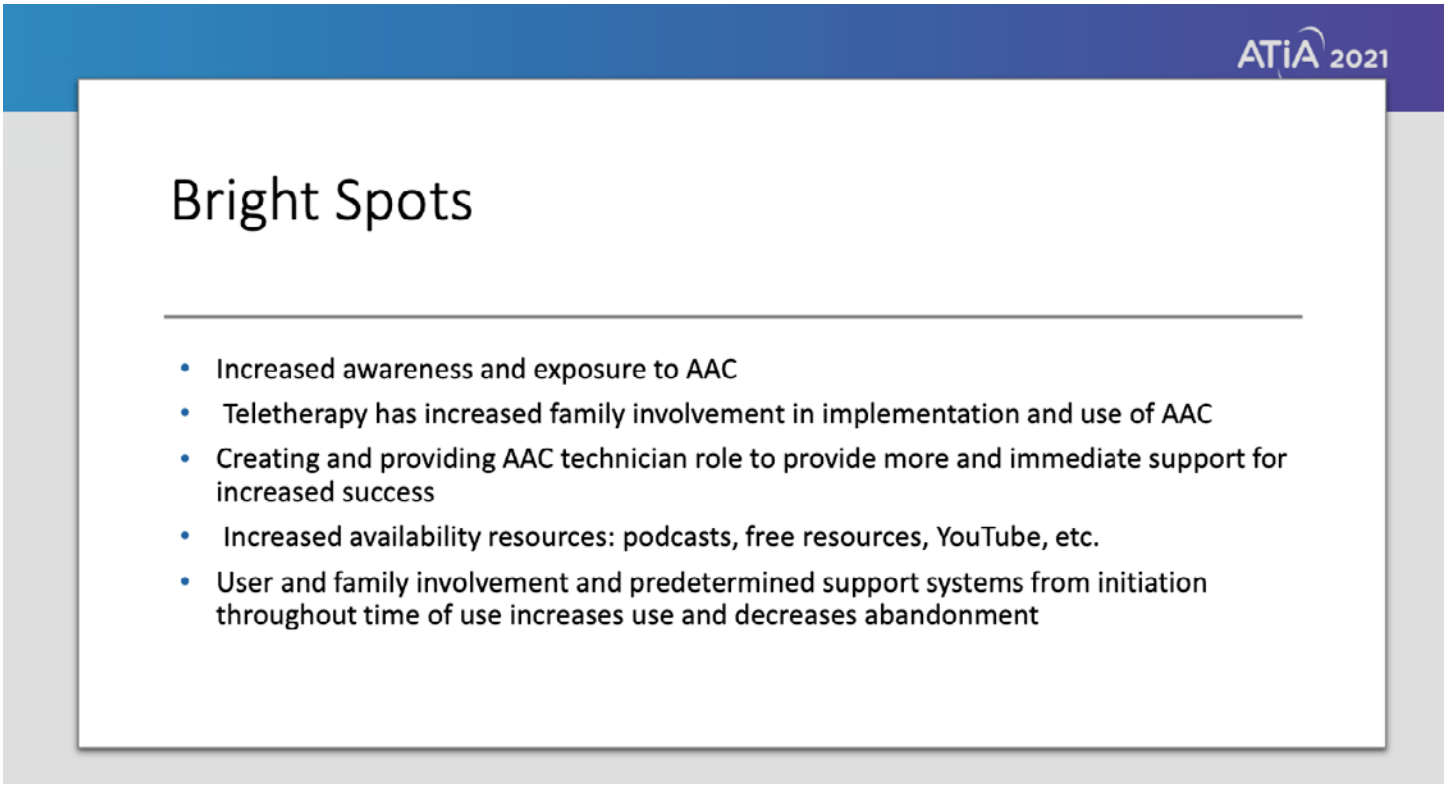
- Reliable
- Durable
- Easy for the family to set up
- Easy for the person to learn, use and control
- Adaptable as the user's abilities and needs change
- Fully supported for user questions and technology issues

SPEAKING OF SUPPORT…

Part of the AAC selection process must be a discussion of where the user and her or his family can go with system questions or problems. Many of these devices are very high tech, and individuals need to know there will be someone who can walk them through usage questions or technical glitches. For many users, their AAC system becomes their voice – and they don't want to lose it!

AAC users and their families should be taught to troubleshoot and problem-solve on their own as well. But they also should never feel stuck if they can't work out a problem. Sue explained how her program approaches support. "We survey people every six months, asking how the system is being used and if they are having any issues. We teach the family to go to the right resources up front, so we don't have to be their tech support and don't become a roadblock. Plus, we have a back-up plan for everyone we see: low-, medium-, and high-tech tools, so they have options if necessary. We put everything they might need in a book, but we let them know they can come to us if they don't receive the response they need.

Vicki reminded us all that there are always issues when someone begins to use a new device. "We should give each person a big neon sign that says, 'You will fall down.' This is messy, you may feel foolish and think you're not doing it correctly. But you'll figure it out and be successful. It's OK to fall down as long as you get back up again."



BACK TO CONTENTS

BRIGHT SPOTS EMERGE EVERY DAY

Despite the many challenges of adopting and using augmentative or alternative communications systems, we have much good news to celebrate. There's increasing awareness of and exposure to AAC, thanks to the activism of users, their families, therapists, schools, state and local programs, and national organizations. There are more podcasts, YouTube videos and other free resources about AAC than ever before. We see and hear about everyone – from toddlers, young children and adults with autism, to war veterans living with TBI, to individuals who have ALS or have suffered a stroke – taking advantage of amazing technical developments. All of this exposure only benefits all of those who use AAC. Awareness leads to acceptance - by both the individuals who need it and the community of people with whom they're interacting. When people with communications needs see more of their peers successfully using AAC devices and living fuller lives, they are highly motivated to give AAC a try.

While the COVID-19 pandemic would seem to have few silver linings, we have seen that the surge in teletherapy has enabled families to be more closely involved as their child or adult relative implements and uses AAC. Parents with other young children don't have to find babysitters or bring the siblings to appointments. Being able to be a part of the therapy session and see targeted strategies modeled by the SLP, leads to better understanding, more confidence - and better use of the device in the home.

Even before the silver lining of virtual therapy visits, the team at Technology for HOME was seeing great progress. Sue shared the success of her program, noting that their regular surveys reveal that 96 percent of the people they see are still using their AAC devices. She attributes the low rate of abandonment to listening and learning from the very beginning, before any device is selected, and being able to coordinate the services from everyone involved with that user.

We could also see and hear Shari's enthusiasm and pride when she told us, "I always thought I knew what my son wanted, but he tells me things with his device that I never would have guessed he wanted. I realized that I don't decipher autism very well, so I could play a big part in his success with AAC."

So despite the very real challenges that individuals who use AAC face, there is hope on the horizon. More light shining on the world of AAC, increased exposure and understanding, and new and different ways of approaching old problems are all helping us battle the beast of abandonment. When all the parties involved recognize the real power of AAC, expanding language and communication, life changing transformation are possible!

Technology for HOME a project of Minnesota Department of Human Services and LiveLife Therapy Solutions, Inc. Resources:

Augmentative and Alternative Communication Process

Preparing for Your Upcoming Communication Assessment

AAC Pre Screening Form

Technology for HOME | Healthy Outcomes Maximized for Everyone - Video of Communication and Sensory Supports

Communication ■

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Activities That Put the FUN in AAC Learning: Part 2

By Lauren S. Enders

In Part 2 of the Activities That Put the FUN in AAC Learning series, participants will learn to harness the power of features within PowerPoint, Google Slides and other "blank slate" style tools (PC, Mac, tablets, Chromebooks) to create engaging customized AAC learning activities.

Demonstrations of how to create custom activities (even on the fly) will be provided. Participants will see how easy it is to import and use photos, web images, AAC system screenshots, and videos to match just about any learner's unique needs. Participants will then learn about the benefits of green screen technology and how it can be used to engage AAC learners. Green screen activities can be surprisingly simple and SO much fun!

Many of the digital tips and tricks learned in Part 1 (using screenshots, removing backgrounds, importing images and videos, etc.) will come in handy while working with the open-ended tools shared in this session. While attending Part 1 is not a prerequisite for this second webinar, attendees might find it helpful to attend both webinars. Be sure to check out Part 3 in this series for a curated collection of ready-made (both free and paid) activities that have been shared by creative folks across the web!

Writing Recovery – Closing the Gap with Clicker 8

By Toni Caggiano and Brynn diScipio

How can we help narrow the attainment gap for children who experience barriers to literacy? What strategies can we put in place to close that gap between what children know and what they're actually able to capture in their written work? How can we deal with the fact that, for many, this gap has widened even further during COVID-19?

During this session, we will demonstrate how Clicker 8 will enable you to give struggling/reluctant writers the tools they need to work more independently and increase their writing output. We'll explore how to use Clicker's rich data to identify the best next steps for each child's writing progress. And we'll discover how to help students regain their confidence and enjoyment in writing.

Activities That Put the FUN in AAC Learning: Part 1

By Lauren S. Enders

In this fast-paced first installment of the Activities That Put the FUN in AAC Learning series, participants will learn about common yet powerful and easy-to-use tools and how they can be used to create engaging customized activities to support students who are learning to use AAC.

Information covered will include taking and using screenshots, image and video sources, use of background remover tools, tricks for using YouTube videos, using gifs to encourage language, plus a host of cool digital tools that can be used to create activities that follow a learner's lead!

Attendees will leave with a digital resource that provides links to the tips, tricks, and techniques shared in the webinar. Be sure to check out Parts 2 and 3 for a deeper dive into options for creating custom AAC learning activities as well as ready-made activities that have been shared by creative folks across the web!

Inclusive Learning 365: Part 2 – Virtual Learning and Leading

By Christoper Bugaj, Karen Janoski, Mike Marotta, and Beth Poss

Part 2: Inclusive Learning for All: Bashing Barriers & Changing Mindsets (Moving Past the "Yeah, but…")

RECENTLY ADDED WEBINARS

Part of creating a culture of inclusive learning acknowledges there are obstacles to implementation. This session will examine strategies for overcoming real and perceived barriers to inclusive education practices and strategies for creating an inclusive mindset for all stakeholders.

Participants will be provided the opportunity to share real life examples from their work. The presenters will facilitate discussion with reflective questions that participants will answer in smaller groups using a digital tool to share their ideas with the larger group.

Inclusive Learning 365: Part 1 – Edtech Strategies for Every Day of The Year

By Christoper Bugaj, Karen Janoski, Mike Marotta, and Beth Poss

Part 1: Creating a Culture of Inclusivity

Learning should be fun and engaging for everyone, even learners who may struggle with school, including those with IEPs, 504 plans or who are multilingual learners.

Join our fun as we explore a range of strategies which engage and empower ALL students to take charge of their own learning. Infuse your learning environment with these inclusive practices that help you design educational experiences that meet the unique needs of every learner.

From apps to browser extensions to web tools, let's find supports to promote active learning for every student. Be ready to virtually collaborate!

Our Favorite Remote/eLearning Strategies for Engagement for Students with Autism & Other Complex Needs

By Torrie Turner, Laura Cuthbertson

This school year comes with many questions from special education teachers facing remote/eLearning, including:

• What do "classroom" activities look like through Remote/eLearning?

• How can we create meaningful connections with students and parents?

• What are some effective ways to deliver engaging lessons to students with complex needs?

This webinar will give guidance and new strategies from special educators as they share how they use Readtopia for remote/eLearning.

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The Significance of Support Walker Mobility for Children with Cortical Visual Impairment (CVI), Complex Speech and Physical Needs: The Bridge School Experience

Summary:

Learn about the extraordinary benefits Bridge School students with Cortical Visual Impairment (CVI) and complex physical and communication needs have experienced using hands-free support walker mobility to participate in school activities! Students are able to accomplish tasks in their walkers they cannot do from their wheelchairs, including using visually directed reach, moving close to objects and peers, orienting to sounds and activities, discovering preferred activities and vocalizing while moving and interacting with peers.

CHRISTINE WRIGHT-OTT, DOTR/L MPA is an occupational therapist with more than 30 years of experience specializing in assistive technology for children with physical disabilities. She is currently in private practice and a consultant at the Bridge School in Hillsborough, California, a private school for preschool and elementary students with cortical vision impairment, complex speech and physical needs. She has conducted two previous NIDRR/OSERS Research and Development grant projects at the former Rehabilitation Engineering Center at Stanford. She authored the chapter" Mobility" in Occupational Therapy for Children and Adolescents, 4-7th editions. She lectures at local universities and conferences including ATIA, CTG, ISAAC, ISS, SWAAAC, Penn State Low Incidence Conference and AAC by the Bay.

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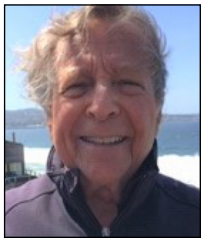

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BACK TO CONTENTS

INTRODUCTION

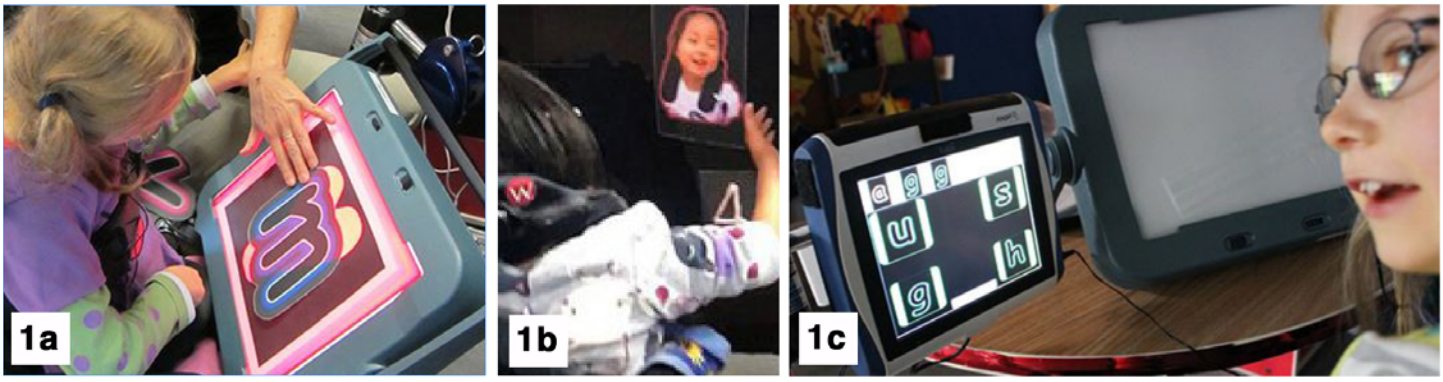
As an Occupational Therapist, I work with school-based teams to recommend assistive technology and mobility devices for children with cortical visual impairment (CVI), complex speech and physical needs. I have had the fortune of observing, for over a decade, how these students have benefitted from achieving self-initiated mobility, particularly when using hands-free support walkers (i.e., Pacer, KidWalk, Pronewalk, FCI Walker, Grillo) (Wright-Ott 2015) and how these experiences have contributed to increasing their interaction with and understanding of their visual world. Self-initiated mobility is achieved by propelling one's wheelchair, driving a powered wheelchair, or standing and walking in a support walker. Children with CVI typically have difficulty with distance viewing, yet too many of these children are left viewing the world from a stationary position in their wheelchair, since few can propel it or are offered powered mobility.

The purpose of this article is to share with clinicians, teachers and care providers the incredible benefits of providing hands-free support walkers to young children with CVI, complex speech and physical disabilities. Hands-free walker mobility provides a means for these children to move across a room to view and touch objects and people, use visually directed reach to explore a novel object or situation, use vision and hearing simultaneously by orienting themselves to sounds and activities, use gestures and signs to communicate, and experience meaningful and authentic peer interactions on the playground by running, jumping, and playing ball games, which are inaccessible from their wheelchairs.

THE BRIDGE SCHOOL AND STUDENTS WITH CORTICAL VISUAL IMPAIRMENT

The Bridge School is a nonprofit school for preschool and elementary children with complex speech and physical disabilities located on a public-school campus in Hillsborough, California. The school is dedicated to ensuring that students achieve full participation through accommodations for CVI, the use of augmentative & alternative means of communication (AAC), assistive technology (AT), and mobility. None of the students are able to use their natural speech for communication, and most (60-70%) of the students have cortical visual impairment (CVI.) Students with cortical visual impairment have an impairment of the visual processing structures and pathways of the brain due to a neurological problem leading to unique and limited visual experiences in interpreting and understanding the world (Roman-Lantzy, 2007.) These children may have a normal eye exam that cannot account for their abnormal visual behaviors (aapos.org.) Dr. Christine Roman-Lantzy, PhD, is a leading researcher in the field of CVI and has been instrumental in developing the assessment for individuals with CVI to help identify these children and provide intervention strategies. The CVI Range (Roman-Lantzy, 2007, 2018) evaluates a child's functional vision in relation to 10 visual and behavioral characteristics and categorizes them into Phase I, II and III. With intervention techniques and accommodations, many of these children progress from one Phase to another. In Phase I, most of the CVI characteristics are present, so intervention is based on building visual behaviors and helping children use their vision functionally. In Phase II, children begin to integrate vision with function, and in Phase III, children are resolving their CVI characteristics. The 10 characteristics of CVI include:

- Color Preference, especially red or yellow.
- Need for movement to elicit or sustain visual attention.
- Visual latency which is a delayed response in looking at objects.
- Visual field preferences: unusual field locations and loss of visual fields (lateral, upper, central, lower.)
- Difficulties with visual complexity (faces, objects patterns) either the object presents as a complex display or viewed against an environment that presents as a complex display, or sensory input is competing with attention such as noise.
- Light gazing and non-purposeful gaze.
- Difficulty with distance viewing.
- Absent of atypical visual reflexes.



Examples of accommodations, adaptations and strategies for students with CVI to recruit vision, so learning is consistent.
Image 1a: A student uses a lightbox to match a large highlighted letter (Glow Writing) to the outline of another letter.
Image 1b: The student's photo is enlarged and presented on a black background to reduce complexity.
Image 1c: This student needs less complexity on her visual display, so only 4 letters are displayed at a time.

BACK TO CONTENTS

- Difficulty with visual novelty and preference for looking at familiar objects.
- Absence of visually guided reach-the ability to look and touch an object at the same time is not evident so the two actions are performed separately.

Although many professionals and parents are still unaware of the extent to which children with significant physical disabilities and complex communication needs also struggle to deal with the sometimes-hidden disability of CVI, the Bridge School has created an innovative instructional program to support these children to learn, communicate, play, move about, explore, and develop language concepts. The Bridge School develops a CVI Range profile for each student to determine which specific methods, materials, activities, and environmental accommodations will be needed to recruit the student's use of vision to enhance access to learning, language, communication, mobility and participation throughout each day and over time. Each student's accommodations for learning are individualized as seen in Images 1a, 1b, 1c. These strategies augment their visual abilities.

WHEN DO STUDENTS USE THEIR HANDS-FREE WALKERS, AND HOW DO YOU SELECT A WALKER?

An equally important part of the program for all students at the Bridge School, is augmenting their mobility by providing them with opportunities for self-initiated mobility experiences using hands-free support walkers. Mobility changes a child's relationship to the objects and people in the environment (Iverson, 2010.) Upright standing mobility provides visual and physical access to the world, allowing humans to see farther and travel longer distances, providing the greatest impact on development and learning (Adolph 2012, 2014.) Since 2006, educators and clinicians at the Bridge School have recognized the developmental, visual, spatial, social/emotional, physical, language/communication, self-determination, and educational benefits of imbedding self-initiated mobility and movement experiences into the curricula by providing each student with a hands-free support walker. Several times a day, students are offered the opportunity to transfer from their wheelchairs into their support walkers to access and participate in classroom and recess activities. Students are able to engage in new experiences and behaviors in their support walkers, which are not evident while sitting in their manual wheelchair.

- Preschool students use their walkers from 30-60 minutes daily for outdoor exploration, music/language group and activity centers. When in their hands-free walker they are able to explore, choose an activity, play hide and seek, push wheeled toys, carry toys, physically interact with and touch peers and imitate in language/music group (Images 2a, 2b, 2c, 2d.)
- Elementary students are in their walkers daily at recess to participate in meaningful playground activities with peers, including ball play, soccer, running and jumping (Images 3a, 3b, 3c ,3d). They also use their walkers 3 times per week for Sports Class, Mobile Math (3e) and inclusive Physical Education.

The Walker Mobility Evaluation

Students receive a walker mobility evaluation based on "Why" they need walker mobility (attain developmental goals, move close to view objects and peers, access recess, increase self-determination), "Where" they will use it (in class, during recess on uneven surfaces, outdoors over grass) and "What" components they will need to accommodate their physical needs (i.e., hands free, small turn radius, transitional body supports that can be

Image 2a: A pop-up bus fits over this preschool student's walker so he can imagine he is a bus driver.
Image 2b: A preschooler with CVI is taking her baby doll for a walk.
Image 2c: A preschool student uses his Pacer walker in a reverse position so he can get close to objects and peers.
Image 2d: A preschool student with CVI pushes a cart to the bakery. Note the red shiny border of the tray and large cookies to accommodate her vision.

BACK TO CONTENTS

Image 3a: A student with CVI plays soccer with a buddy while in his ProneWalk during inclusive Physical Education.
Image 3b: Peers play a modified soccer game with a large orange ball and a red outlined goal backstop to accommodate their visual needs
Image 3c: Two elementary students with CVI decide to race each other in their KidWalks during recess. The girl in pink was winning the race, but stopped to turn around to look at her peer to reassure herself that she was winning the race!
Image 3d: Two friends walk over to the accessible play structure at recess.
Image 3e: Elementary students use their support walkers during Mobile Math by walking through large measuring displays, to determine who is the tallest in class.

removed if motor control improves, custom seat, headrest support.) The evaluation may take several months, and equipment is loaned during the evaluation period. Once the team determines the walker model, components and modifications, a report, specifying the student's mobility goals and support walker recommendations, is presented to the school district through the IEP process. This assures that the walker will transfer with the student after transitioning from the Bridge School.

WHY IS SELF-INITIATED MOBILITY SO IMPORTANT FOR CHILDREN WITH CVI?

Mobility Develops Spatial Cognition and Memory

All of us depend on spatial memory skills to remember where objects are located within our environment and to help us find our way around (navigational abilities.) Spatial memory is acquired by actively moving ourselves through the environment as we gather and process sensory information, both visual and proprioceptive. It is not acquired from being passively pushed in a wheelchair (Foreman, et.al.1990.) What is surprising is that the same spatial memory skills needed to remember where things are in the 3D environment, are also used for remembering where items are located in the 2D environment, such as screen displays (Hochheiser, H. et. al. 2009.) Children with a physical disability, who have not yet achieved self-initiated mobility, are delayed in spatial cognition and memory. Rivera (2012) studied spatial cognition and spatial memory in children with Spina Bifida using a 2-position hidden toy task and discovered the pre-crawlers could only search successfully for the hidden toy for 14% of the trials. However, following the onset of achieving mobility, they improved to 64% correct search. Kermoian and Campos (1988) conducted a similar study and concluded that infants with Spina Bifida, who achieved self-produced locomotor experiences from crawling, walking or using a mechanical walker, demonstrated enhanced performance on spatial search tasks.

Walking Affects Language Development

Several studies have suggested an association between walking and language development. The acquisition of walking in typically developing infants propels linguistic development (Oudgenoeg-Paz, 2012) and is associated with a significant increase in both receptive and productive language, independent of age (Walle 2014.) We have observed many students who demonstrate a greater ability to vocalize and engage while standing and moving in their support walkers than when sitting in their wheelchairs. Walle (2016) proposes that "physiological changes from an upright posture, such as changes in respiration, positioning of the diaphragm or length of vocal tract may facilitate ease of verbalization and articulation." (page 7.) Students have also been observed using more signs and gestures while moving in their hands-free support walkers. A student during a field trip to explore a fire truck, walked to the barrel of toys collected for Toys for Tots, looked at his teacher, then pointed to the sign, indicating he wanted her to read the sign to him.

Mobility Positively Affects Social Emotional Development and Social Interactions

It is not surprising that with the onset of walking, typical toddlers transition from being passive observers to active participants, making bids for social interaction (Clearfield 2008.) Children with physical disabilities, who cannot move across a room to explore and interact, are at a great disadvantage. Van Schie (2013) concluded that social function followed a course of progressive restrictions over time in non-ambulatory children with cerebral palsy ages 5-9 years, when compared to children who could walk with or without walking aids. Thus, it is possible that children who do not experience active or self-initiated mobility

BACK TO CONTENTS

Image 4: Two preschool students interact in their walkers, while building a cardboard playhouse together, and discover a game of hide and seek.

early in life, could be further disadvantaged in their development across other areas (Stanton, 2002.)

Students who use support walkers are provided with the ability to move about and therefore encounter opportunities to physically engage and interact with their peers. At the Bridge School, it is common for students to move close to one another and reach out to touch, hug, share or request a toy. An example of walker mobility encouraging authentic peer interactions is shown in Image 4 when two preschool students were interacting in their walkers by building a cardboard playhouse together and discovered a game of hide and seek. An example of the impact mobility has on social emotional development occurred in music group when a preschool student became upset when the teacher announced, "Music is all done." Another student moved away from the group and closer to her peer. She then reached out to hold hands and put her head on her friend's shoulder, demonstrating concern and empathy for her. This opportunity would not have been possible if the students were in stationary wheelchairs.

Walker Mobility Provides Exercise, which is Linked to Academic Achievement

It has been reported that physically disabled children have low daily physical activity levels compared to their peers (Malltais 2014.) However, students at the Bridge School look forward to using their support walkers at recess and during inclusive physical education, providing many opportunities to exercise by running, jumping, spinning, and participating in playground games like kickball and soccer. Hillman et al. (2009) concluded that a 20-minute session of walking boosted typical children's subsequent performance on tests of reading, spelling and math. Students assigned a daily schedule with more physical activity breaks outperformed control-group peers in mathematics and reading (Tomporowski, 2018.) Physical activity enhances cognitive function, improving memory, behavior, concentration, and academic achievement. Inactivity negatively impacts brain health and executive control, especially maintaining focus, working memory and multitasking (Phitamerica.org.)

WHAT HAVE WE OBSERVED IN STUDENTS WITH CVI WHO USE SUPPORT WALKERS?

Physically disabled children with CVI encounter significant challenges to learning, particularly if they are dependent upon others for mobility as they are unable to experience the visual and learning opportunities self-initiated mobility can provide. The observed opportunities and behaviors of students with CVI at the Bridge School, who use support walkers, are further described considering the Visual/behavioral Characteristics of CVI which include the following:

Visual Complexity and Difficulty Viewing Faces, Objects and Patterns is Reduced When Students Move Close to Objects and Peers.

It is common to find children with CVI experiencing a difficult time viewing faces, distant objects, and complex patterns. However, students with CVI, in support walkers, often choose to move very close to peers, achieving physical and visual contact with them (Image 5.) The teacher intervenes to help the children understand what and who they are seeing by saying, "You found _____" (name of student) and described the other child's hair color and clothing.

Image 5: Two preschool students with CVI and difficulty viewing faces decide to move closer to look at each other.

BACK TO CONTENTS

Students Can Move Close to Objects and Activities to Compensate for their Difficulty with Distance Viewing.

The world may seem overwhelming for children with CVI, who typically have difficulty viewing objects and activities at a distance. If these children have no means for self-initiated mobility, they are limited in what they can see and understand and are not free to explore. Walker mobility gives these children the power to discover novel objects on their own terms and the ability to choose how and when to interact with objects and people. A preschool student with CVI sits in her activity chair (Image 6a) but has difficulty with distant vision. In Image 6b, the same student explores the classroom, finds a mirror and discovers her image. Her teacher helps her understand what she is seeing by describing her outfit, body, arms, and legs. In Image 6c, a preschooler, who just transferred from her activity chair to her walker, decides to sneak up and surprise her teacher, demonstrating initiation, intention, motivation, planning, executing, visual reach and vocalizations. Image 7a shows a student with CVI in his wheelchair, waiting to transfer into his walker. Once in his walker (Image 7b) he looks for, finds, and walks to his favorite place in the classroom, a mirror (Image 7c.) The series of

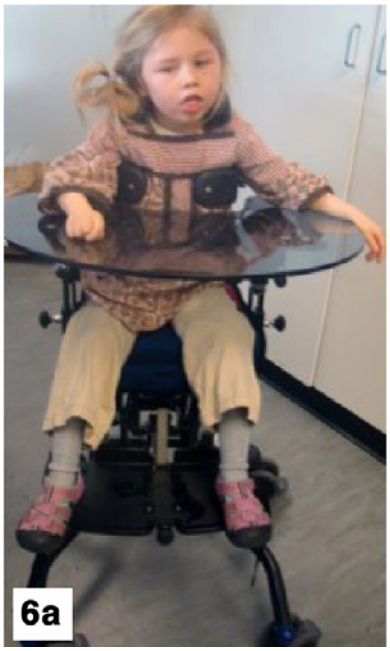


Image 6a: A preschooler with CVI sits in her activity chair, but has difficulty with distant vision.
Image 6b: The same preschooler explores the classroom in her walker, finds a mirror and discovers her image. Her teacher explains what she is looking at by describing her arms, body, legs and outfit.
Image 6c: A preschooler who just transferred from her activity chair to her walker, decides to sneak up and surprise her teacher who is sitting on a stool.

Image 7a: A preschooler waits in his wheelchair for a transfer into his WalkAbout walker.
Image 7b: In is walker, he moves himself to his favorite place in the classroom.
Image 7c: He finds his favorite place in the classroom, the mirror, from across the room and moves close to see himself.

BACK TO CONTENTS

actions that occur reflect a complex multisensory process which contributes to spatial cognition and memory. First, the student decides to move, because he is attracted by something he wants to explore (curiosity and vision.) In order to reach the object, he needs to ignore multiple distractions (e.g., noise, conversations, movement elsewhere) and localize the object in space (spatial cognition, vision and attention). He must then coordinate his body to reach the desired objects (using intention, motor coordination and visual search). Finally, he reaches his destination (the mirror) and looks closely at himself. The feedback he gets from this series of actions acquired through self-initiated mobility supports his learning mechanisms.

Self-initiated mobility provides a means for a child with CVI to explore distances and express preferences. A preschool student in language group stands in her walker with her peers. As the instructor describes the salient features of what is appearing on the screen, he asks the question, "What is that?" She reacts by leaving the group making the decision to move closer to the monitor so she can see what is being displayed. Just as important is the ability to move away from an undesirable situation. A student during language group offered a picture to another student who chose to back up away from the circle, not wanting to accept the picture and interact with his peer.

Some children may take several months or a year to develop the ability to move independently in a walker. One such student with CVI would not initially put her feet on the floor to take steps, however she was encouraged to stand in her walker during group and preschool activities. She enjoyed standing in her walker and would try to jump and wiggle when she was excited. Mobility was encouraged by placing activities within a few steps from her walker which included either a shiny red pompom, a mirror with shiny foil grass along the edges to represent moving through a car wash, an iPad with music playing or reaching a grocery cart with red reflective tape around a cookie tray (Image 2d.) She finally learned to take steps after 6 months. In group circle time, she was not yet able to consistently identify and choose her own photo. After a year of walking in her support walker, one day she decided to move across the room towards the wall of student cubbies, where each one had a student's photo hanging above it. She surprised everyone by walking to her cubby, reaching for her photo and taking it off. She then ran away from the scene, by pushing herself backwards across the room while still holding on to her photo! Walker mobility experiences may have positively affected her ability to improve and engage her distant vision.

Mobility Provides Opportunities for Using Visually Directed Reach

Students may experience difficulty looking at something and reaching for it simultaneously, described in the CVI Range as the "Absence of Visually Guided Reach." Students in wheelchairs may encounter few opportunities to use visually guided reach. In Images 8a, 8b, 8c, the students have discovered on their own, an object to reach, touch and explore. Hallowell (2007) reminds us that "children are more likely to remember an action or object when they discover it through experience than when they are told about it." Students with CVI more often demonstrate visual reaching while standing and moving than when they are seated in their wheelchairs. In Image 8d, a student with CVI has better visual reach and attention while painting on the wall canvas in her walker.

Mobility Encourages the Discovery of Visually Novel Objects.

Students may experience "Difficulty with Visually Novel Objects," preferring to look at familiar objects and ignoring novel

Image 8a: A preschool student with CVI finds a plant and reaches out to touch it using visually directed reach.
Image 8b: A student's favorite activity is to reach for the handle of the office door and try to open it, which encourages him to use visual reach with central vision, which is not his preferred visual field.
Image 8c: A preschooler during a field trip walks to the wheel of a firetruck to explore and touch it.
Image 8d: A student uses an art tool for painting and is observed to have better visually directed reach while standing in her walker than when seated in her wheelchair.

BACK TO CONTENTS

Image 9: A preschool student discovers a novel object in class (a tent) during a camping theme. Her teacher describes the salient features to her.

Image 10: A student tries to kick an orange soccer ball, encouraging her to use her lower visual field.

objects. Mobility provides endless opportunities for children with CVI to encounter novel objects and activities. Image 9 shows a preschool student who discovered a novel object in the classroom (a tent) during a camping theme. She moved to the tent on her own and reached out to touch it. As she touched the tent, her teacher provided a verbal description of what she had found, telling her "You found the tent, it has a green door. You can open it up with the zipper. You can go inside the tent or stay outside. Do you want to go inside the tent?" The preschooler chose to walk inside the tent.

Mobility and Movement Encourages use of Visual Fields and Orienting to Activities

Most children with CVI have "Visual Field Preferences." They can view objects or light in certain fields (lateral, upper, central or lower) and may ignore objects in other fields. Many of our students show a preference for lateral visual fields and ignore their lower visual field. However, some activities they engage in with their walkers, such as when kicking a ball, require use of lower visual fields. Staff can support their use of vision using color and movement. Image 10 shows a student with CVI who looks down at the movement of the bright colored ball, as she kicks it. In Image 11, a preschool student uses his walker during art to paint with his feet. He's encouraged to look down by the

Image 11: A preschool student engages in a foot painting art project. The bright paint, tactile input and foot movements encourage him to look down in his lower visual field.

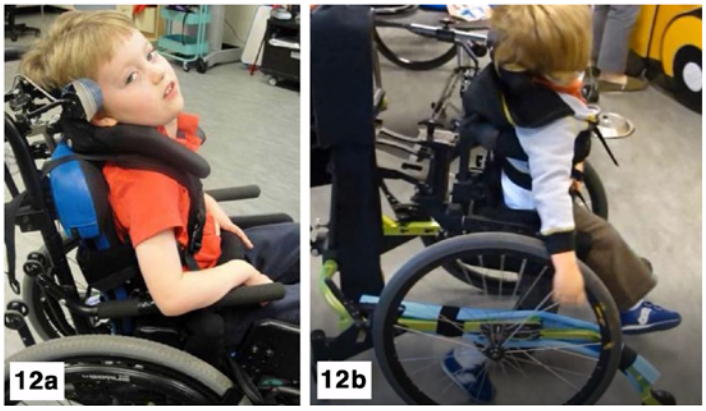


Image 12a: A preschool student is listening to an activity which is behind him but is unable look at it, because he has no means to orient himself towards the activity.
Image 12b: The same preschool student in Figure 12a, has learned to turn himself around in his walker by maneuvering his feet and holding the wheel with his wrist. Now he can orient himself and use hearing and vision simultaneously to view the "Wheels on the Bus" activity in the classroom.

combination of bright paint along with the tactile feedback he gets from his feet touching the paint as he moves them while painting.

Without mobility, children are unable to orient to activities and sounds occurring around them. Sitting in a wheelchair with body supports, straps and a headrest also limits the ability to look around and use vision and hearing simultaneously to orient to activities that can be heard but not seen. Image 12a shows a child who is unable to simultaneously use vision and hearing to understand what is happening behind him. In Image 12b the same student is in his walker and hears an activity he wants to see. By placing his arm on the wheel and taking steps, he turns himself around to view the activity, which is not something he can do in his wheelchair.

Support Walkers Can Provide Mobility and Movement to Help Students Attain or Sustain Visual Attention.

Children with CVI typically require movement by either moving themselves or by looking at an object that moves to attain or sustain their visual attention (Roman-Lantzy, 2007.) Staff have noted that students with CVI demonstrate improved ability to focus and engage during group activities, when they are standing and bouncing in their walkers (KidWalk dynamic components), as compared to when they are sitting in their wheelchairs. A preschool student with low tone and CVI, for example, chooses to bounce in his support walker before he looks at the photo the teacher is showing each student during group. This movement may be helping him to sustain visual attention.

WHAT FEATURES OF SUPPORT WALKERS ARE PREFERRED FOR CHILDREN WITH CVI?

There are several features of walkers that should be considered for students with a visual impairment:

- **The Walker Should be Maneuverable Over Various Surfaces**.

Children with CVI in walkers may not be able to view and avoid uneven surfaces. The larger the tire, the more likely the walker will roll easily over uneven surfaces. The KidWalk and ProneWalk are preferred at the Bridge School, because they are designed with a large mid-wheel, making it maneuverable indoors, over carpet in the library, outdoors on the playground, and over grassy fields for playing soccer.

- **Dynamic Movement**.

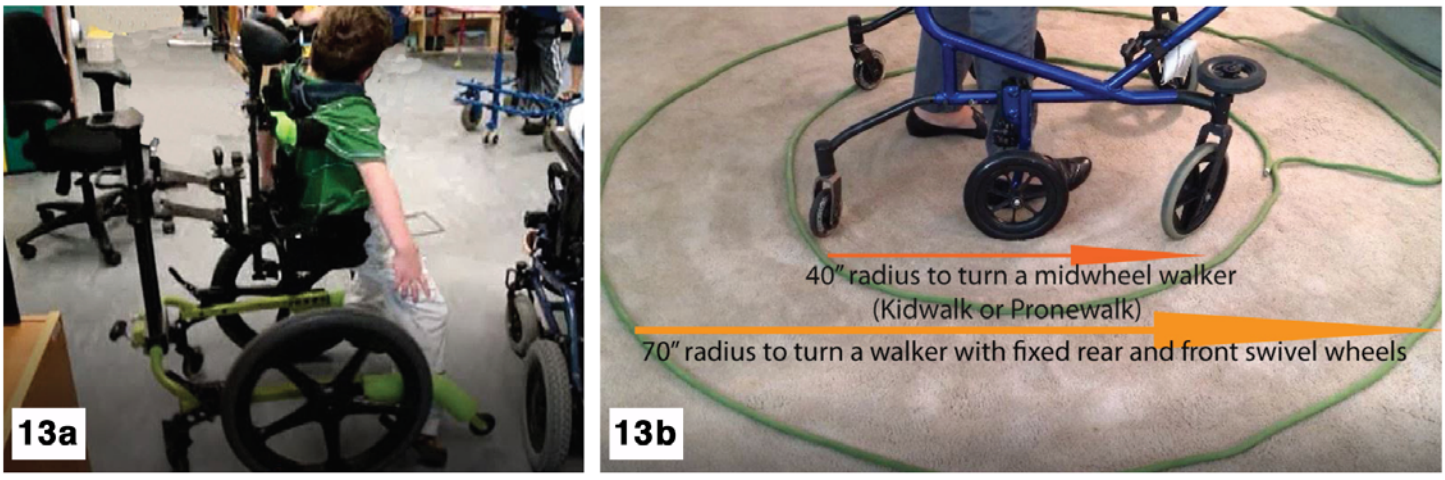


Image 13a: A student with a visual impairment, can turn himself around in between a book case and another student's wheelchair, due to the small turn radius of his KidWalk walker.
Image 13b: The Kidwalk and Pronewalk have a small 40" turn radius due to the mid-wheel placement, which allows users to turn around their own axis. A 70" radius is required for the same size child with a walker that has fixed rear wheels and front swivel casters, due to the large sweep it requires for turning the walker around.

BACK TO CONTENTS

Young children with CVI often benefit from sensory motor activities and movement, such as swaying, jumping, wiggling or spinning in their walkers, which can assist them in attaining and sustaining visual contact. The KidWalk is designed with sway and dynamic vertical lift, and the Buddy Roamer has vertical lift.

- **Small Turning Radius.**

It is important, especially for indoor mobility, to choose a walker that has a small turning radius so the child with a visual impairment can efficiently turn around without bumping into objects (Image 13a.) The mid-wheel of the Kidwalk allows users to spin on their axis, which makes a small turning radius with a 40" diameter (Image 13b.) A walker for the same size child, but designed with fixed rear wheels and front swivel casters, measures a 70" diameter turn radius, requiring the child to use twice as much floor space to turn around, making it more difficult to avoid bumping into objects and people (Image 13b.)

- **Fit Affects Function**

Children with complex physical challenges and CVI, who have difficulty holding their head upright, may benefit from using a headrest, which is available on a supine style walker designed with hardware behind the child (KidWalk, Buddy Roamer.) It is critical to make certain that the child has an intimate and supported fit in the walker, particularly at the hips and trunk, which provides stability for functionally using their eyes and hands for visually directed reach.

- **Ability to Mount a Low to Mid-Tech AAC device to the Walker Frame**

Students at the Bridge School use single message devices, switches, low tech AAC devices and iPads mounted to their walkers during group times. If devices are mounted onto the frame of the walker, they should not interfere with the child's leg and arm movements. RAM Mounts (Rammount.com) are a good solution for mounting these devices (Images 14a, 14b, 14c.)

SUMMARY

Children with cortical visual impairment typically demonstrate characteristic behaviors which may include difficulty with visual novelty, visually directed reach, distant viewing, using other visual fields and difficulty seeing faces. Surprisingly, the Bridge School students with CVI, who achieve mobility in support walkers, frequently use visually directed reach in novel situations, locate and move to distant but preferred locations in the classroom, demonstrate a preference for close contact with peers and objects, orient and attend to sounds in the classroom by turning themselves in their walker to view an activity, direct their vision to look at objects and movement (typically not in their identified preferred field of vision), vocalize more frequently in their walkers than in their wheelchairs and use movement like bouncing, wiggling, spinning and jumping, which may assist in attaining and sustaining visual attention. They encounter more problem-solving opportunities, use their upper extremities, often reaching above shoulder height, use gestures, signs and AAC tools/technologies, express preferences, grow in their self-determination skills, and achieve meaningful peer interactions.

These findings suggest that students with CVI who have significant speech and physical disabilities can benefit from self-initiated mobility experiences in the school environment and may be acquiring skills they would have otherwise not demonstrated without the opportunities to experience mobility through the use of hands-free support walkers. The combined impact of

Image 14a: A Ram Mount (Rammount.com) is used to mount a switch to a child's walker.
Image 14b: Ram Mounts are used to attach a Step-by-Step Communicator to the back handle of a KidWalk and a blue switch to the frame. The student can access the blue switch with his elbow to use the Step-by-Step at recess to communicate with his peers.
Image 14c: A custom made 4 button voice recording unit is mounted to a walker with a RAM Mount. However, it must be consistently positioned in the same place and angle to the accommodate the student's visual limitations.

BACK TO CONTENTS

directly addressing the cortical visual impairment issues faced by Bridge students while simultaneously providing opportunities for hands-free upright mobility can prove life-changing. It is difficult to overemphasize the extent to which Bridge students with CVI have improved in their use of functional vision, their communication skills, their independence, their engagement and learning, and academic performance. This shift in the school's approach to children with CVI is making a meaningful difference in the children's lives, their family's lives and in the daily satisfaction staff feels as a result of the dramatically improved outcomes of these children.

SUPPORT WALKERS AND MANUFACTURERS
NOTE: NOT INCLUSIVE OF ALL WALKERS

Buddy Roamer
Pacificrehabinc.com

KidWalk and ProneWalk
Primeengineering.com

Grillo
https://www.ormesa.com/en/_home/

Winnipeg or FCI Walker
Freedomconcepts.com

Pacer Walker
Rifton.com

BACK TO CONTENTS

Mustang
www.r82.com / www.etac.us.com

RAM Mount with a switch
Rammount.com

Little Step-by-Step
Ablenetinc.com

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BACK TO CONTENTS

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Distance Learning + Google Forms = Literacy Support for All Students

Summary:

Are you ready to go beyond using Google Forms for basic comprehension quizzes and roll your instruction, formative assessment data collection, and immediate feedback to students in one nice package so students focus on learning and not on navigating through multiple files and platforms? This article shares examples of literacy lessons with built-in video and image support, virtual word walls, and immediate feedback for students to transform your distance learning literacy instruction to support all students.

Google Forms has some amazing built-in supports that caused them to quickly become one of my favorite distance learning tools during this crazy pandemic. Read on to learn how to take advantage of the built-in supports in Google Forms and go beyond using them for basic comprehension quizzes. We can use Google Forms to provide video instruction, collect formative assessment data, and provide immediate feedback to students in one nice package. Doing this allows students to focus on learning and not on navigating multiple platforms and files.

By the end of this article, you will understand the advantages of using Google Forms during distance learning, know the steps to take to create Google Forms with image and video support, and access sample Google Forms to help you get started.

You may have already seen creative ways to use Google Forms, like to create escape rooms, scavenger hunts, or alternative endings to stories. These are all fun ways to engage students, but the primary focus of this article is to show you how to support learners with special needs by adding multimedia supports for students and to streamline the delivery of your lessons, particularly your literacy lessons.

The first benefit to using Google Forms during distance learning, is they make a nice way to accommodate students who struggle navigating within a learning management system. As the pandemic hit in March of 2020 and we started distance learning, I observed students who just could not navigate their learning management system without a *lot* of help from an adult. It did not seem to matter what platform these students were using - some were using Seesaw, some were using Google Classroom, some Schoology. No matter the platform, it was all just visually and motorically too much for them to manage. These were students who were capable of doing the work once they had help navigating to the assignment and were given step-by-step instructions to complete the assignment, but they were not successfully being independent in using a traditional learning management system (LMS). As an alternative to the LMS, we modified students' work into a Google Form. We would take the video lessons that teachers posted in the LMS and made that the first item on the Google Form. Then sometimes

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Disclosures: Amanda is employed by Intermediate School District 917. Amanda is also the owner of Raising Hope Ranch, LLC, some of the pictures and videos in this article feature animals from the Ranch.

BACK TO CONTENTS

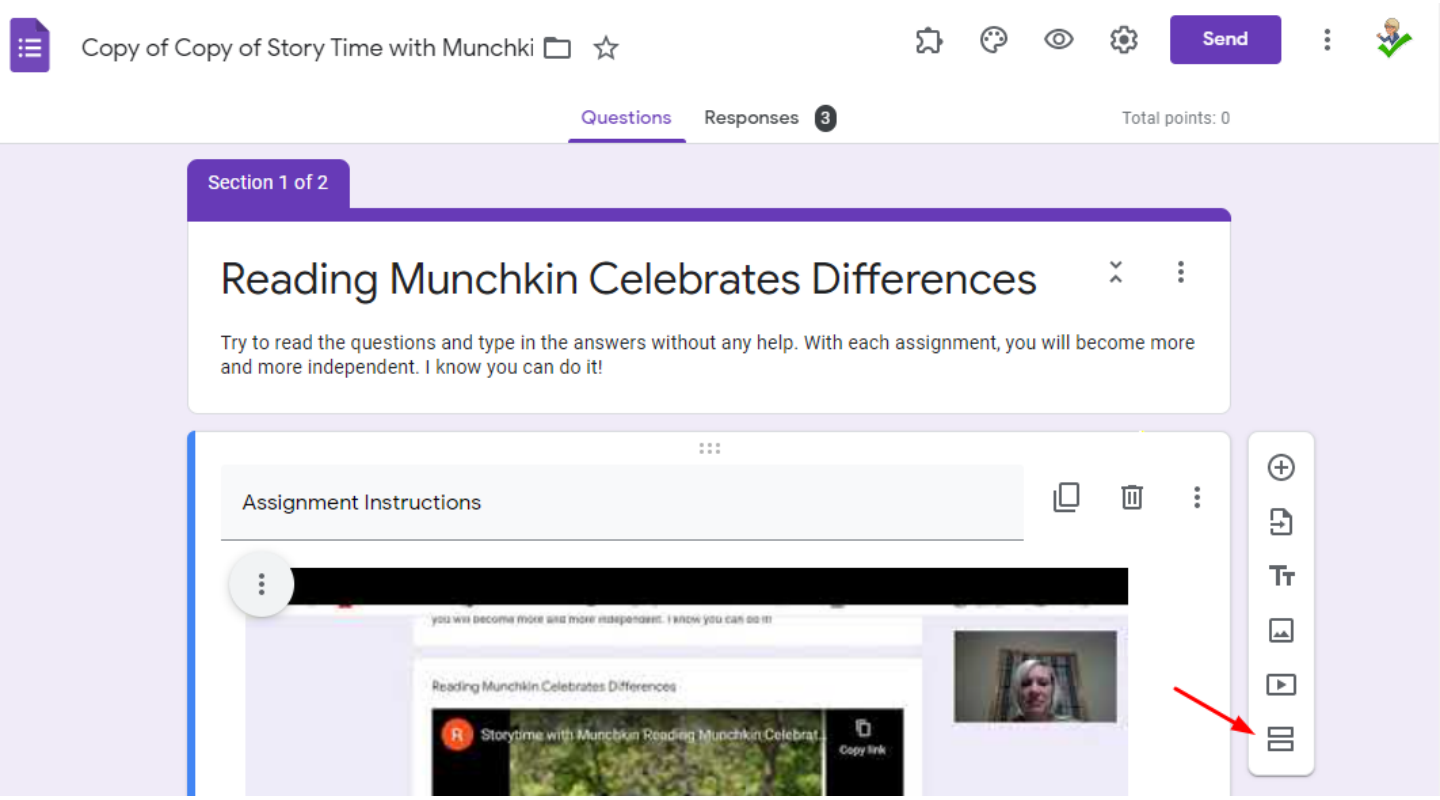

Image 1*:* Adding a Section

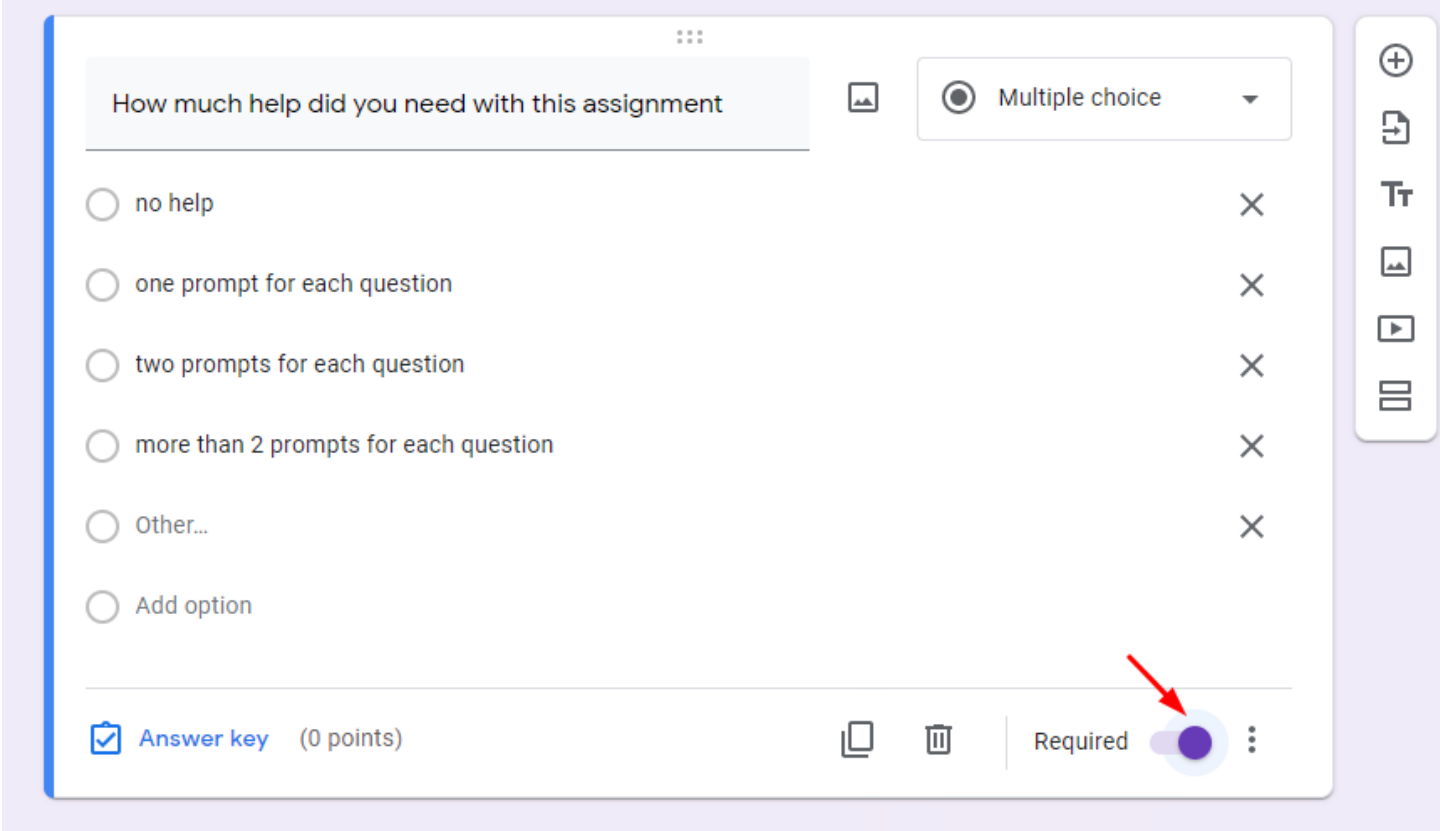

Image 2*:* Making Questions Required

the student needed additional video instructions inserted into the form to explain how to complete the assignment within the Google Form. Next, some students benefited from a new section added for each question so they could focus on one question at a time on the screen. To view how to do this, see **image 1** *Adding a Section*. For these students, we would make sure each question was required so that they couldn't skip ahead until they answered the question on the current page, see **image 2** *Making Questions Required*.

Besides helping students who struggle with navigating an

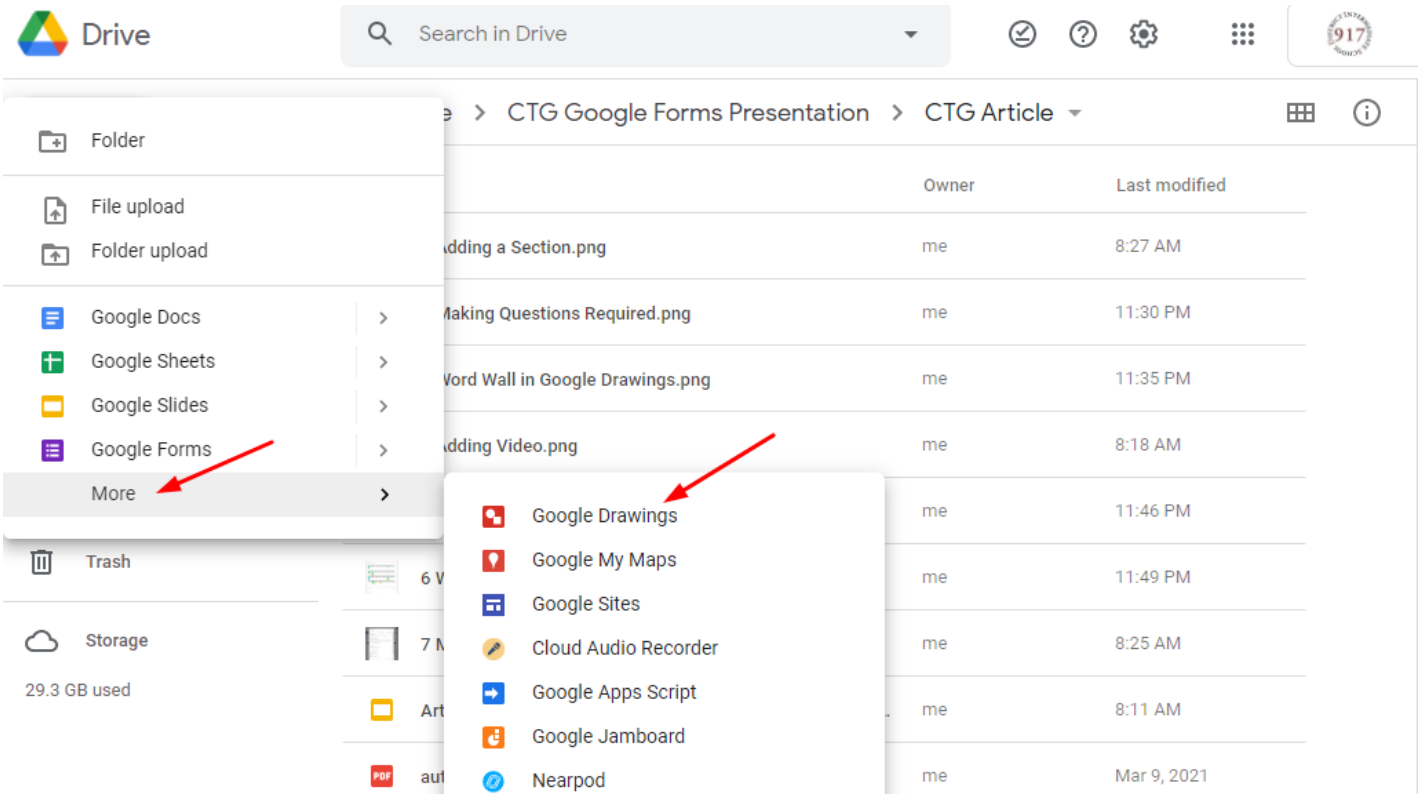

Image 3*:* Start a New Google Drawing

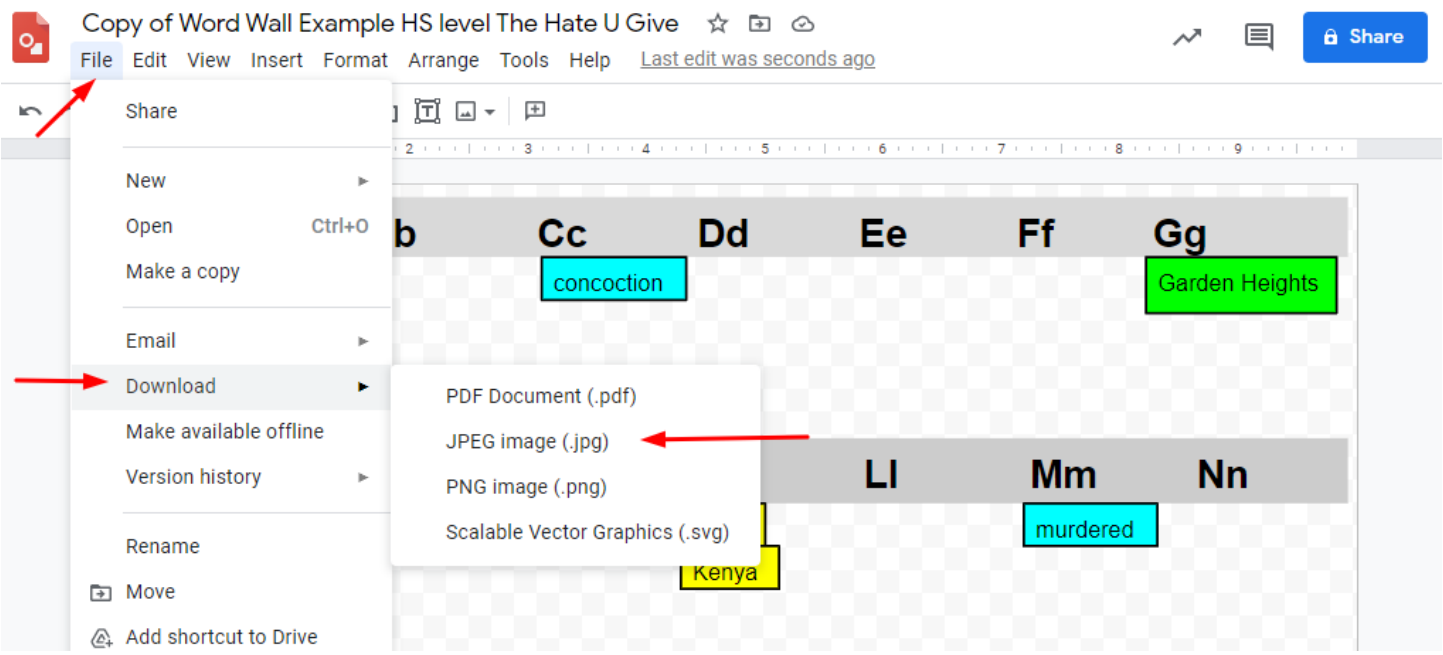

Image 4*:* Download Word Wall as Image

BACK TO CONTENTS

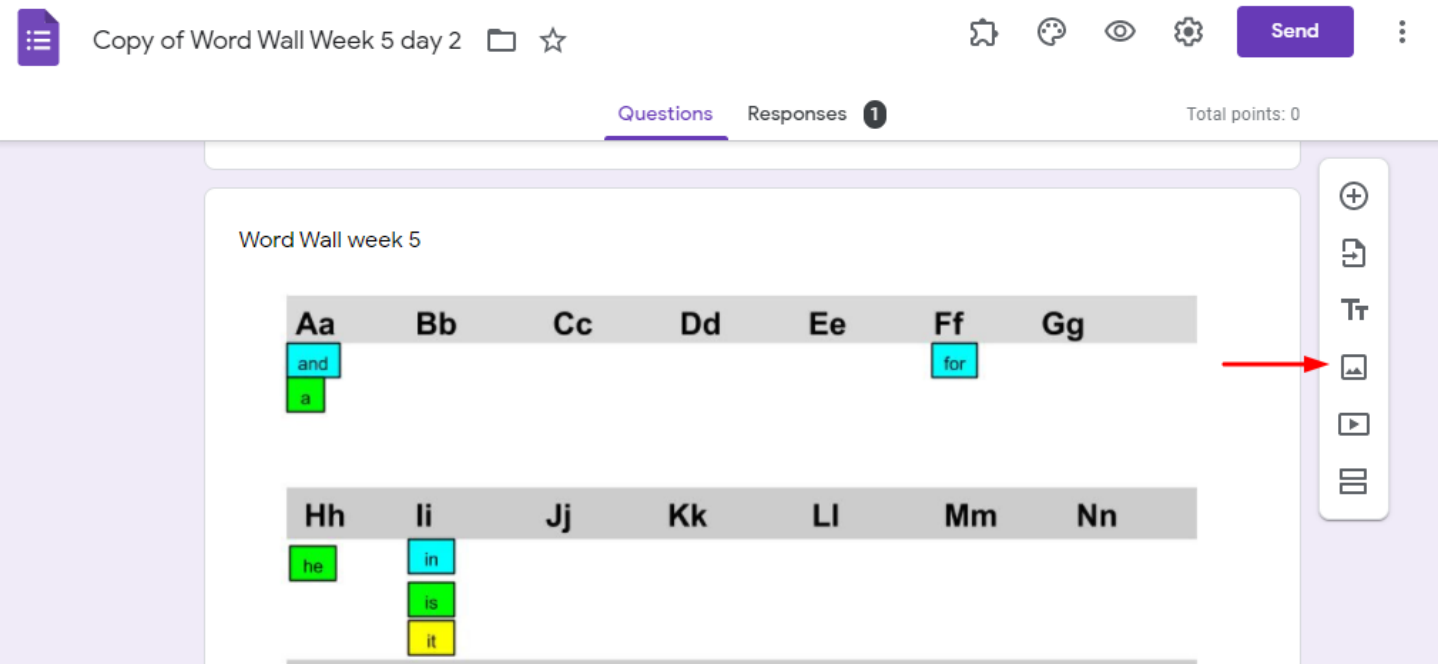

Image 5*:* Adding an image to Google Forms.

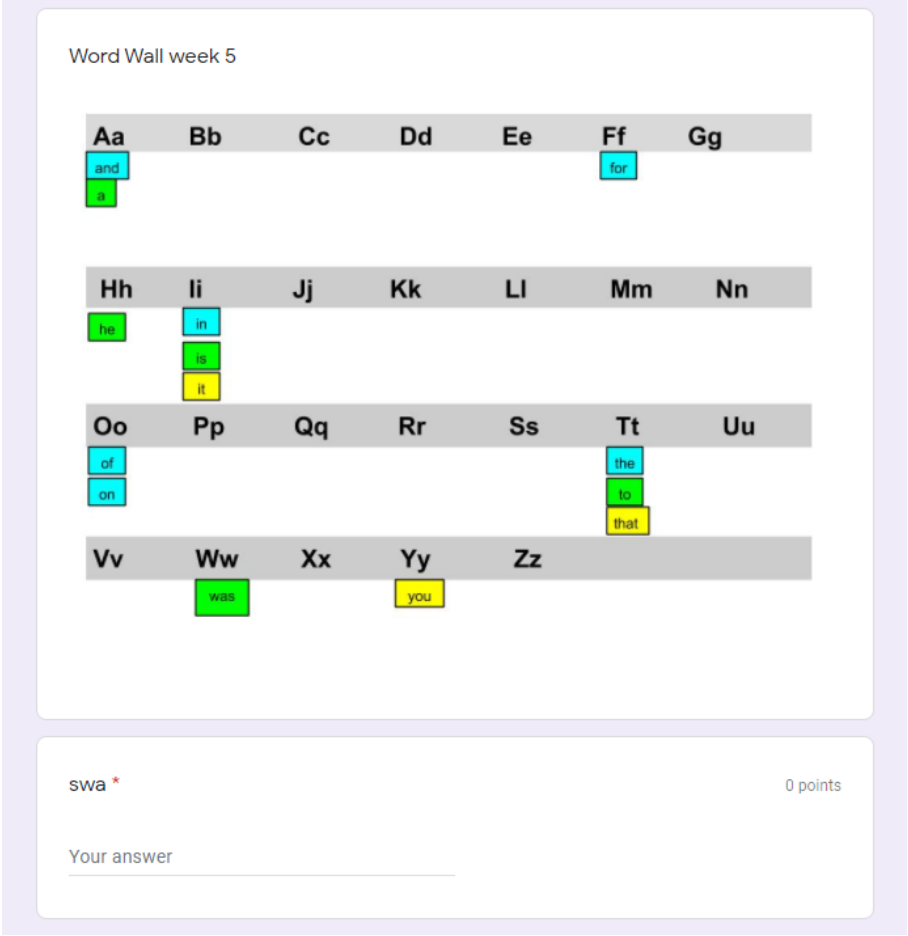

Image 6*:* Student View Word Wall for Reference in a Google Form

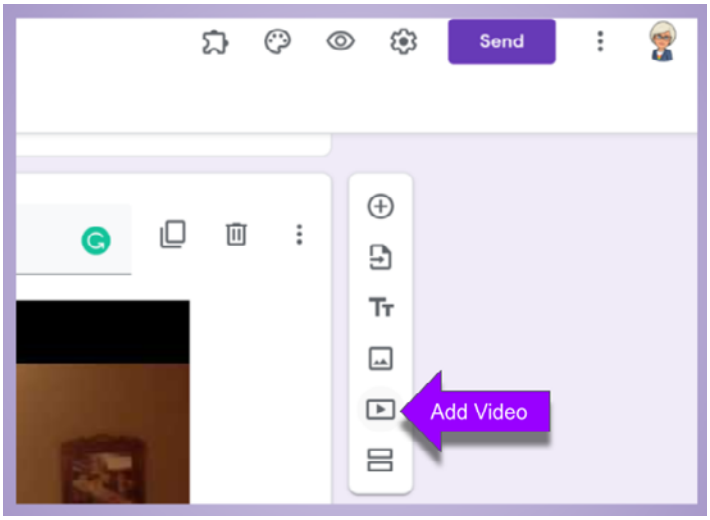

Image 7*:* Adding Video

LMS, Google Forms can be effective in providing visual cues while answering questions. We made use of this feature to deliver Word Wall lessons. When the pandemic started, we needed a new way to deliver word wall lessons as this was an important piece to literacy instruction. We needed a way to take the physical word wall in the classroom and present it virtually to students. We turned to using Google Drawings for the word wall and placing the Google Drawing of the word wall into Google Forms. Use this link (http://bit.ly/WordWallCopy) to create your own copy of a Google Form Word Wall lesson. You may want to reference this form as you continue reading. Google Drawings is often an underutilized tool, partly because it is one of those tools that are "hiding" in the More menu in Google Drive. See **image 3** *Start a New Google Drawing*. By creating your Word Wall in Google Drawings, it is easy to continue to add words to it. It took a while to come up with a template that worked, so feel free to make your own copy of this one (http://bit.ly/GDrawWW). Once the words are added, for your lesson, you will need to download it so that you can add it to your Google Form. To

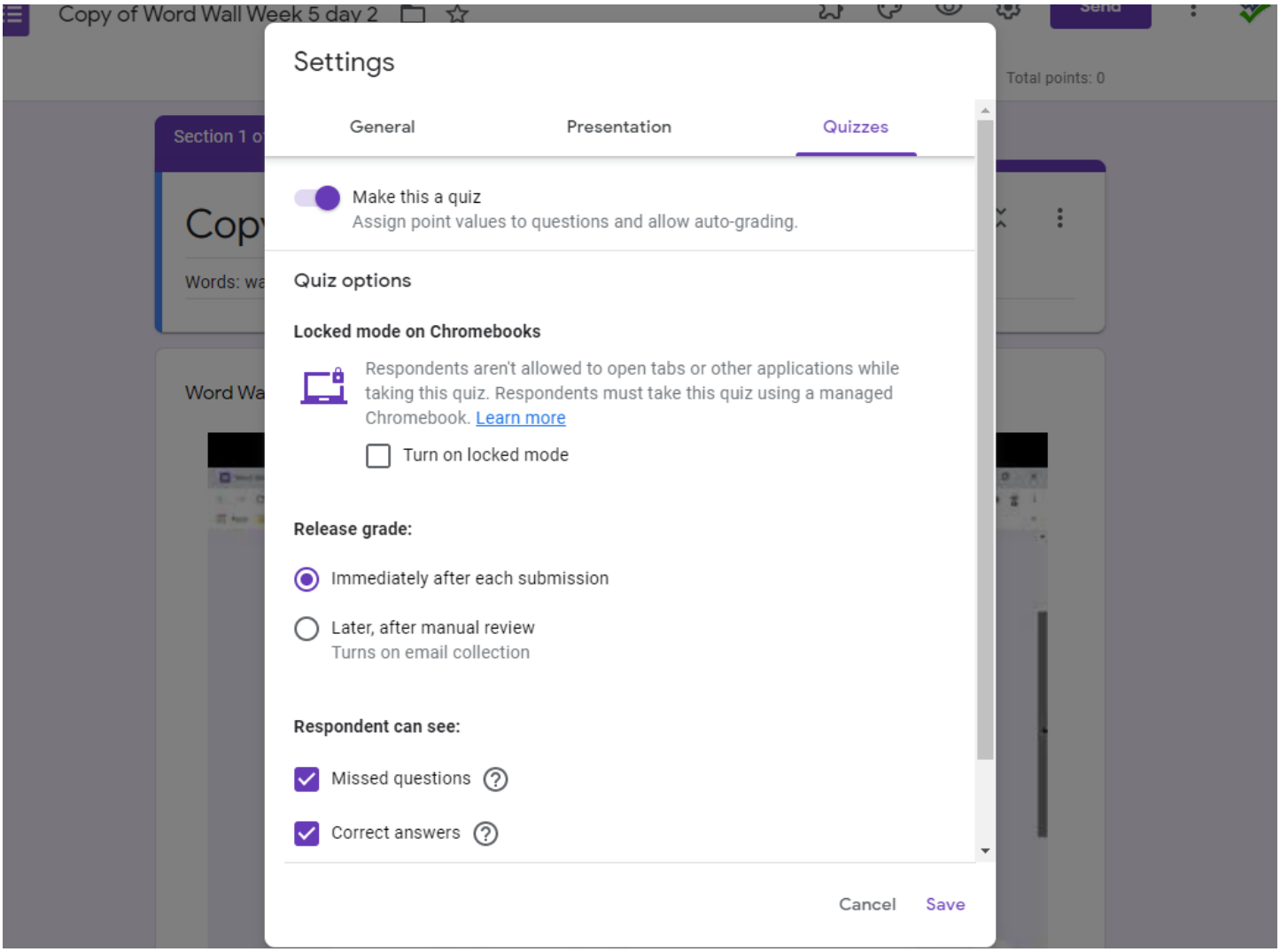

Image 8*:* Making a Google Form a Quiz

BACK TO CONTENTS

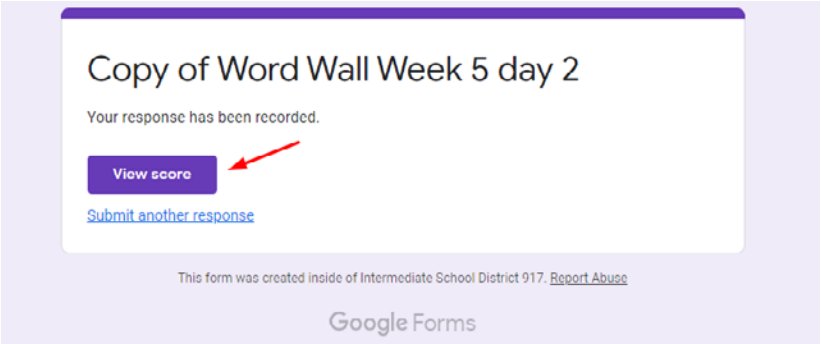

Image 9: View Score Option

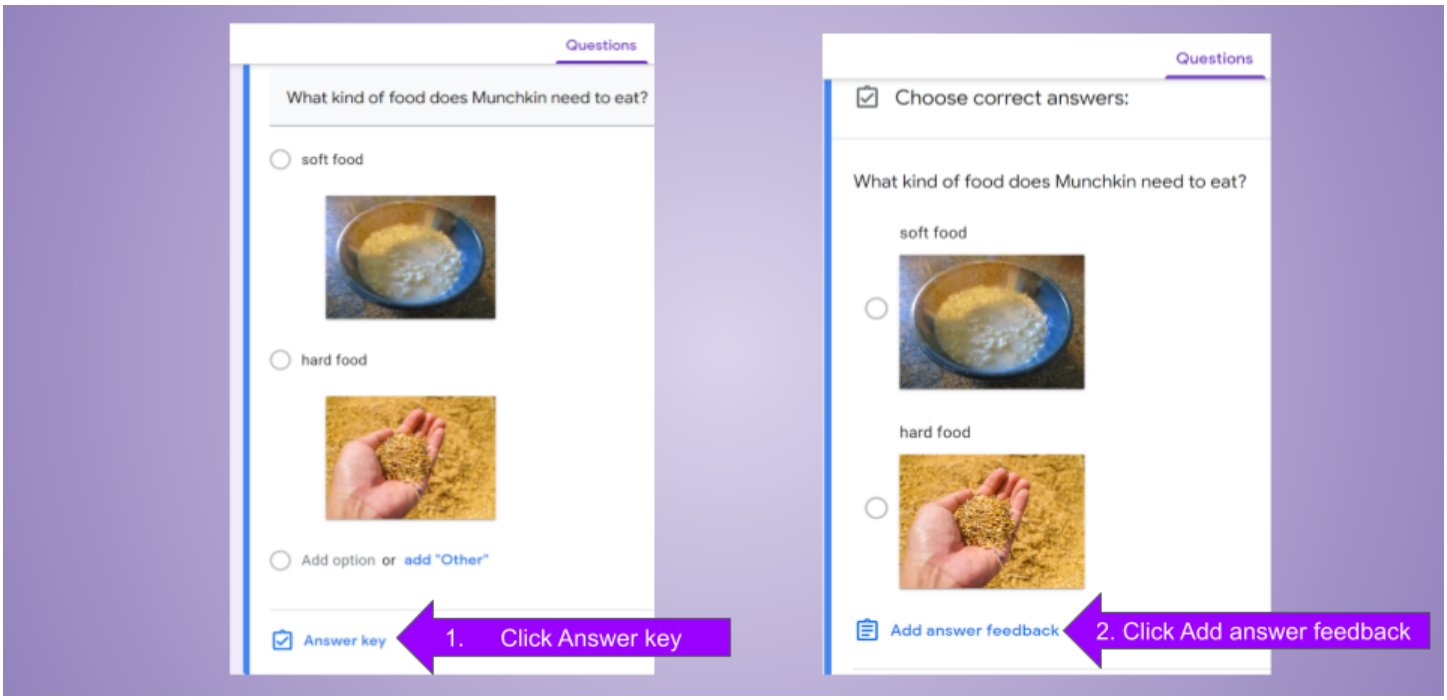

Image 10: Adding answer feedback

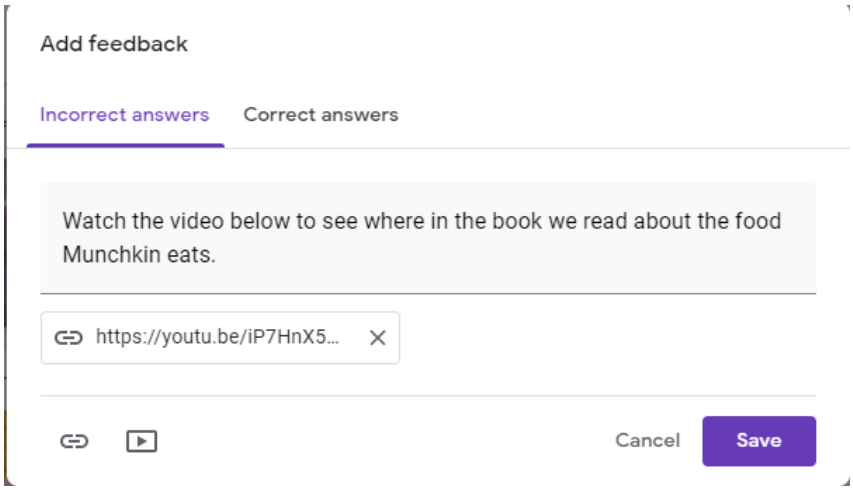

Image 11: Adding Answer Feedback

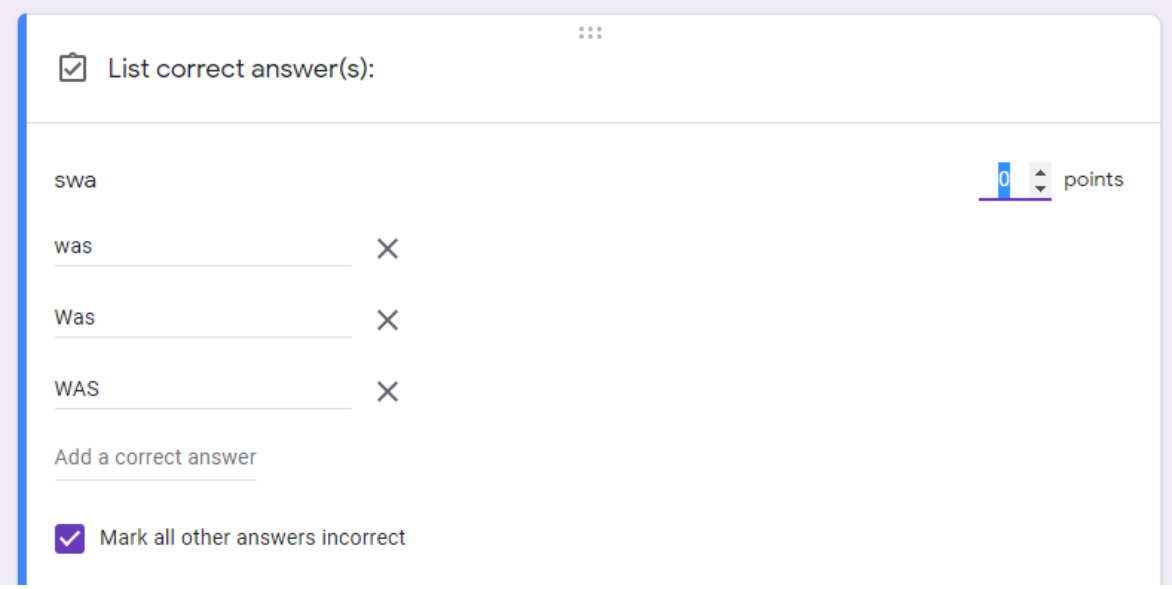

Image 12*:* Providing Short Answer Feedback

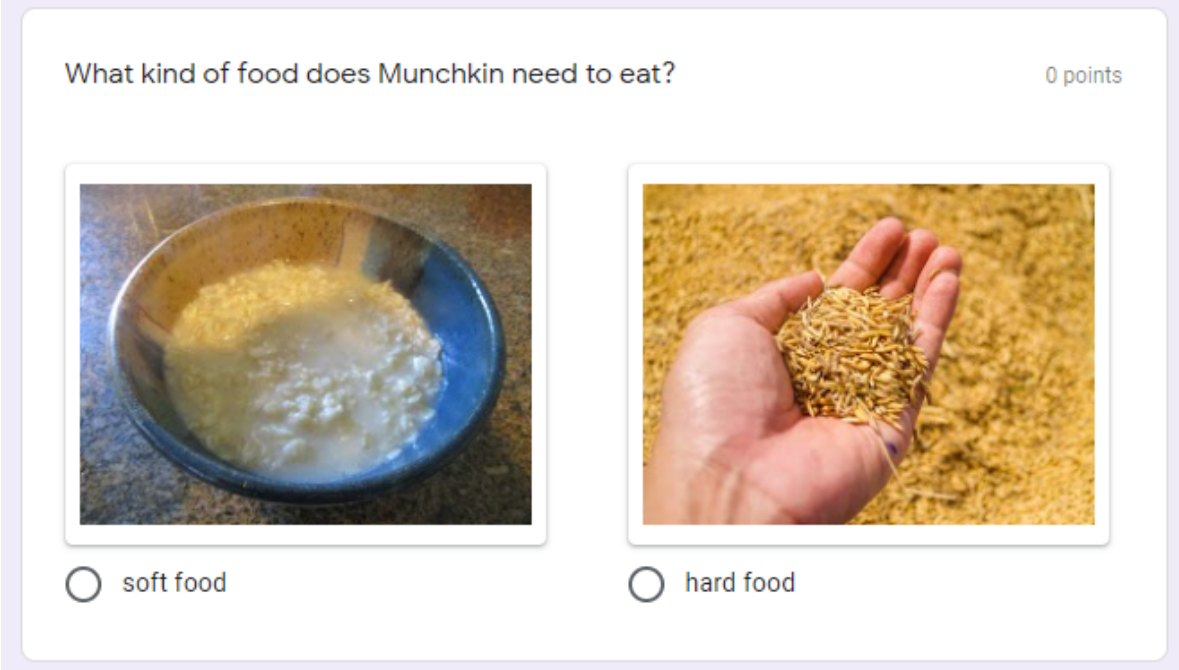

Image 13*:* Student View Images on Multiple Choice Questions

download your Google Drawing, go to the File menu, Download, and then choose either jpeg or png, see **image 4** *Download Word Wall as Image*. To upload that Word Wall image, or any image for that matter, choose the image icon, see **image** 5 *Adding an image to Google Forms*. For an example of how this will look to students when they are completing the Google Form, see **image 6** *Student View Word Wall for Reference in a Google Form*. Once the word wall was created in Google Drawings, you can create a short instructional video, upload it to YouTube, and make it the first item on the Google Form, then students can get their instruction and directions for filling out the form directly in the form itself. See **image 7** *Adding Video* for how to add a video prior to a question in a Google Form. After the instructional video, you can add your question or activity for students to complete. If you are doing a word wall lesson, you will want to make sure that students can reference the word wall for each question/activity. In other words, you want to be sure they can see the question and the word wall at the same time on the screen. You can resize the word wall image by dragging the corners until you find the right size where it's big enough for students to read easily but

BACK TO CONTENTS

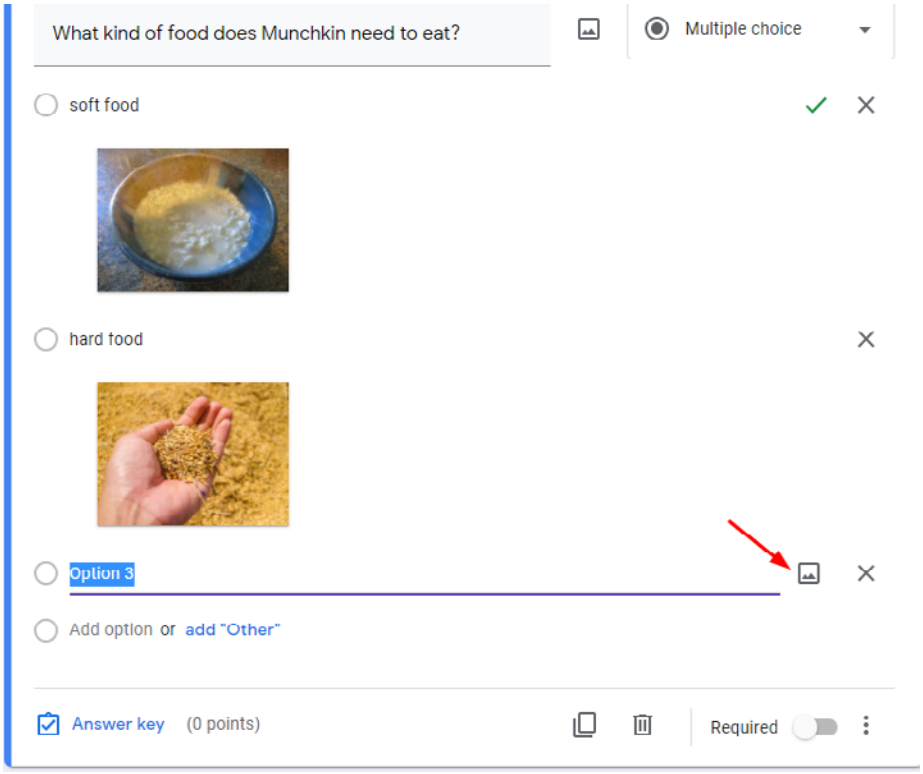

Image 14: Adding Images to Multiple Choice Questions

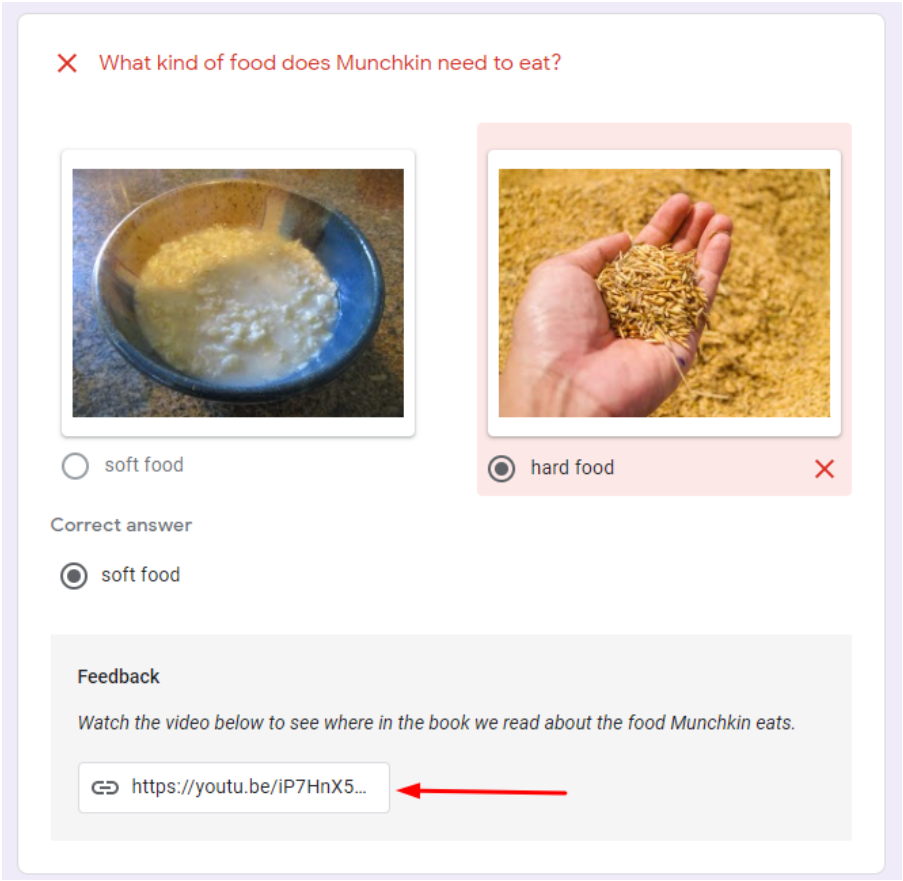

Image 15: Student View Playing Video Feedback

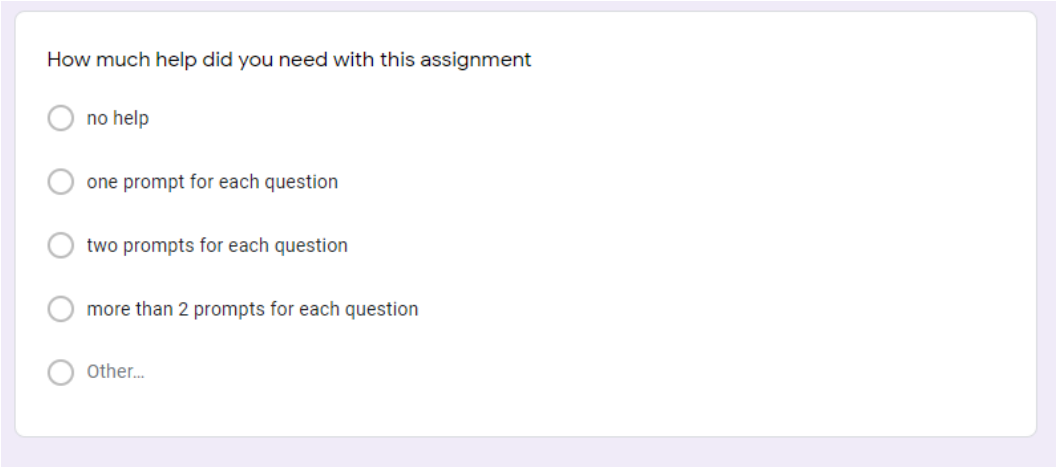

Image 16*:* Adding Prompt Questions

small enough so that they can see the question and the Word Wall at the same time.

Once the Google Form lesson is created, it's time to make use of another benefit of using Google Forms, making it a quiz. Turning a Google Form into a quiz not only allows for easy grading but more importantly, it allows us to provide immediate feedback to students on their answers. No longer do students have to wait for us to correct their paper before knowing how they did. Plus, for the students who need it, we are able to provide feedback in the form of a video to explain the correct answer, instead of just marking it wrong.

To make a Google Form a quiz, start by going to Settings, choose the quizzes tab, then turn on Make a Quiz, see **image 8** *Making a Google Form a Quiz*. There are some other important settings here as well. Under the Release Grade heading, I like to choose Immediately after each submission so students can get that quick feedback. In the Respondent can see section, I like to check Missed questions and Correct answers, again so that we can give students as much information about the correct answers as possible. By turning these three settings on, when students complete a Google Form, they will see the option to View score as shown in **image 9** *View Score Option*.

To make viewing their score meaningful to students, we have several options for how to provide feedback on correct and incorrect answers. Once you've turned on quiz mode, choose Answer Key for each question and choose the correct answer. Then add feedback by clicking on Add Answer Feedback. See the location of these features in **image 10** *Adding answer feedback*. On the Add Feedback screen, shown in **image 11** *Adding Answer Feedback*, you have the option to add text feedback for correct and incorrect answers and/or to add a link or video for feedback.

When we think about right and wrong answers, we usually think about multiple-choice questions, but these are not the only questions you can have Google Forms score automatically for you. Short answer questions can also be marked as correct or incorrect and feedback can be provided for those as well. When you are adding all the possible correct answers for the short answer questions, as in **image 12** *Providing Short Answer Feedback*, be sure you consider upper- and lower-case options. For example, if the only correct answer you list in the answer key is "was", if a student types "Was" or WAS" it will be counted wrong. There might be times when you want students working on correctly typing the correct upper- and lower-case letters, but when you don't want to take points away for capitalization, be mindful of entering all case options in the possible correct answer list.

So far, we have explored four benefits of using Google Forms for distance learning literacy instruction: condensing work from an LMS system into a single Google Form, presenting video instructions, presenting video feedback, and presenting one question at a time to students. Next, let's look at the benefit of adding images to the answer choices of multiple-choice question types.

Images can be a big benefit to students when completing comprehension questions. See an example of a reading comprehension lesson in Google Forms, http://bit.ly/GFormsReadCompMCD . Looking at this Google Form, you can see it started with a video that gave students a purpose for reading and then went into reading a book, and finally asked students a comprehension question. That comprehension question had multiple choice answers with images. A student view of this can be seen in **image 13** *Student View Images on Multiple Choice Questions*. To add images to the answers in a multiple-choice question, when in edit mode, you are going to choose the little image icon to the far right of the answer text as shown in **image 14** *Adding Images to Multiple Choice Questions*. You can then choose to upload an image from your computer, add one from your Google Drive, take one with your computer's camera, or do a Google image search for one.

Since we are talking about comprehension questions, another effective Google Form feature to take advantage of is the ability to use video feedback to take students back to a particular spot in a book so they can see the correct answer themselves. Take a look again at the Story Time with Munchkin Google Form, preview the

BACK TO CONTENTS

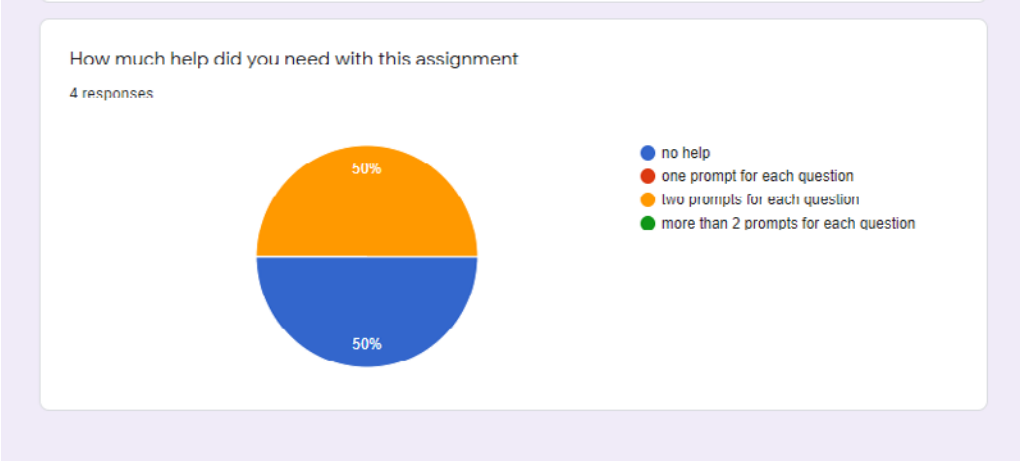

Image 17*:* Viewing Prompt Responses

form yourself and fill in the answers. As you do, mark the incorrect answer for the kind of food Munchkin eats. Then when you submit your answers, click "View Score", and you'll see the video shows where in the book the student would find the correct answer, see **image 15** *Student View Playing Video Feedback*.

We have mentioned a couple of possible literacy lesson types that work well with Google Forms, including word wall lessons and reading comprehension lessons. Another fun way I have found to use Google Forms is to take advantage of the video feature and use it as a writing prompt. You can make your own copy of this sample writing prompt Google Form lesson featuring a sassy Cockatoo to see how that might look. Students love sharing their responses to these writing prompts with others.

As you start using Google Form lessons, you may decide that you need a way to keep track of how much help the adults in a student's home are giving students when they are completing these forms. It might even be the adults in a school setting if students are completing them there with someone's help. Many students have specific goals and objectives on their IEPs to be more independent when completing work. To collect that data, you can put a question in that asks about prompts as shown in **image 16** *Adding Prompt Questions*. Then just check in with those adults once in a while and make sure if the students were the ones answering those prompt questions that they were doing so accurately. If it becomes a problem to include the prompt questions within the Google Form that you give the student, you could also send a separate Google Form to the adults to fill out that references how many prompts students needed on each assignment. Collecting prompt data is another tremendous benefit of using Google Forms as the data will be graphed automatically for you and you can choose to open responses into a spreadsheet if you would like. See **image 17** *Viewing Prompt Responses*.

As if all these benefits were not enough, Google Forms has some basic benefits that make them a good fit for distance learning or independent learning time. These include the ability to easily access them on a smartphone and sometimes this is the only way a student can access the internet at home. Google Forms are also accessible on tablets which for many students is more accessible than a computer or Chromebook. Google Forms also integrates easily with a Bitmoji classroom through a direct link to a form. Finally, Google Forms also integrates easily into Google Classroom which many teachers are already using.

Let us review all the benefits of using Google Forms that we have talked about in one list:

1. Easily streamline work from an LMS into a manageable Google Form
2. Present video instructions
3. Present one question at a time to maintain student focus
4. Provide image support to the answer choices on multiple-choice questions
5. Keep track of adult prompts needed by the student to complete the Google Form assignment
6. Provide feedback to students on their answers in video form if needed
7. Easily accessible on all devices including smartphones and tablets
8. Integrates easily into a Bitmoji classroom or Google Classroom

Even with all these advantages, I am sometimes asked "Doesn't it take a lot of time to create these types of Google Forms?" My answer is a strong, "kind of". Does it take longer than using a canned curriculum? Absolutely. Do we have many canned curriculums that we can use without customizing to meet the needs of our students with special needs? Nope. Does creating a Google Form like the ones mentioned in this article take longer to create than other methods of customizing curriculum to deliver it in a way that students can meaningfully participate? Nope. I have found Google Forms to be one of the most efficient and effective methods to deliver content, provide feedback, and collect data. It has been a win for students and teachers! ■

BACK TO CONTENTS

product spotlight

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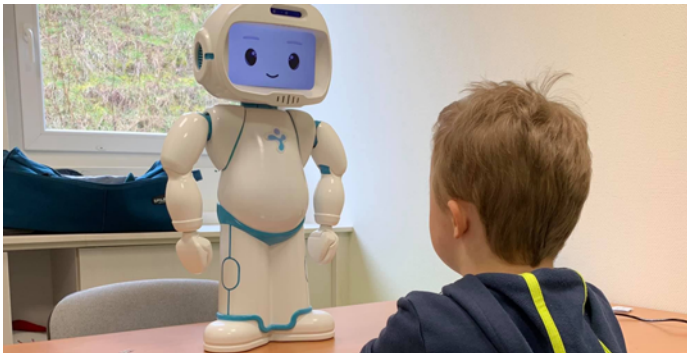
LUXAI LAUNCHES QTROBOT FOR HOME, THE FIRST-EVER IN-HOME AI TUTOR FOR AUTISTIC CHILDREN



LQTrobot engages children with meaningful play-based activities based on evidence-based practices, such as Applied Behavior Analysis, and the results of years of research on child development and social-emotional trainings. The expressive robot comes with an endless array of learning programs covering a broad range of skills related to social and emotional wellbeing, language development, communication and cognitive skills. The programs are designed to begin teaching at the child's current skill level, while gradually increasing the complexity and difficulty of the games. The in-house special education team at LuxAI continually broadens the curricula and is collaborating with several autism professionals in the EU and USA to ensure research and development are continually ongoing.

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BACK TO CONTENTS

SimplyHome – Where Innovation & Independence Meet

For 17 years, SimplyHome has developed a comprehensive suite of technology services designed to promote independence for individuals who are living with a disability or aging in place. Their SimplyHome System, the Firefly, is a sleek and affordable device that integrates environmental controls and sensors to alleviate caregiver concerns while empowering the individual to independently maintain or increase day to day living skills.

Their individualized approach listens and understands the unique set of strengths and challenges for each individual and tailors a combination of enabling technologies into a comprehensive care plan. Each product is intentionally specified with a focus on promoting the highest level of independence, while also ensuring one's safety and privacy.

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SpeakUnique – Voice banking solutions for all speech needs. In your own words.

SpeakUnique are a voice banking service that create personalised synthetic voices for use in speech generating devices.

They offer three different voice banking services depending on the individual's speech needs.

Voice Build: a synthetic replica of an individual's voice, based on a short recording of their voice.

Voice Repair: a "repaired" synthetic version of an individual's voice, for when their speech is impaired at the time of recording, e.g. through slowness, slurring or changes to their vocal quality.

Voice Design: a synthetic voice based on old recordings of an individual's voice or a bespoke synthetic voice designed to fit a set of desired characteristics, such as age, accent and gender.

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BACK TO CONTENTS

Reader – Reading Reinvented. Read anything. Read anywere. Read your way.

TEXT TO SPEECH

…like a performer playing music from score.
200+ Voices. 30 Languages. You will find a perfect instrument.

One free premium voice from Acapela.
61 free voices in iOS 12.
100+ premiums voices available through in-app purchase.
Offline: does not require Internet connection.

MORE FEATURES

- Reading Modes – Sleeper timer. Repeats. Word-by-word and sentence by sentence reading. Speed reading.
- Audio Controls – Change voice, speed, pitch, pause duration. Custom pronunciation dictionary. Skip margin text and citations.
- Visual Controls – Change font, font size, colors, line and character spacing, and margins.
- Library Management – Organize documents and books in folders. Search, filter and sort. Reading list.
- OCR – Scan documents or books using camera. OCR scanned PDF files. (Requires Voice Dream Scanner.)
- Annotation – Set bookmark. Highlight text and add notes. Export notes.
- Safari Extension – Save online articles and files directly from Safari.
- iCloud Sync – Synchronize and backup your documents across all your devices.
- Watch Support – Free companion Apple Watch app can play your reading list offline while not connected to iPhone.

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Talk To Me Technologies – zuvo™ 16-D, Unparalleled speed and clarity. Limitless potential.

SIMPLE YET POWERFUL -

Say what you want! Communicate with speed and confidence using this extra-large, easy-to-use, speech-generating device! The innovative detachable speaker can be easily removed and placed on a table or worn around the neck for easy, face-to-face communication.

WHO IS THE ZUVO 16-D FOR?

The zuvo 16-D is an ideal communication solution for children and adults with significant communication difficulties resulting from Rett syndrome, cerebral palsy, ALS, stroke or anyone needing a lightweight, portable communication device with an extra-large screen.

Communication options range from very simple, symbol-based vocabulary sets to more advanced keyboards, incorporating word and phrase prediction, as well as core word and phrase-based pages. Much of the vocabulary content draws from and incorporates the research of TTMT professionals and other industry experts.

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BACK TO CONTENTS

Global Symbols – Board Builder Communication Boards the easy way

Create boards to aid communication using thousands of free images from our library, and even your own.

Design, build, save and print communication boards online.

Everything is stored safely in your Global Symbols account.

- **FOR CREATORS**
  Manage and publish Symbol Sets
- **FOR COMMUNICATORS**
  Exchange pictures to create conversations
- **FOR EVERYONE**
  Discover, mix, match and make symbol use personal

David Banes introduces Global Symbols and explains what they do and what they want to do. (See video below)

LEARN MORE

SquareGlow is an accessibility-first manufacturing business that improves their customers lives.

PRODUCTS FOR EVERYONE

Their products are accessibility driven and a focus on design to create something very special. They believe in quality, care, and creating unique products that helps everyday people go about their lives. They hope they'll inspire you too.

DEAF-OWNED

Many don't realize this, but they are entirely deaf-owned. Their team is entirely Deaf & Hard of Hearing. This gives them an advantage at accessibility issues than most companies. They understand hearing-loss needs best.

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BACK TO CONTENTS